SERVICE MANUAL

DC INVERTER MULTI ZONE

DUAL (2), TRIPLE (3) and QUAD (4) CIRCUIT

MULTI SPLIT OUTDOOR UNITS

HEAT PUMP

YN018GMFI16M2D (2 Zone)
YN027GMFI16M3D (3 Zone)
YN036GMFI16M4D (4 Zone)

DC MULTI OUTDOOR UNITS

CONTENTS

1. General information of Outdoor Units

Model name	Dimension (mm(in))	Compressor
YN018GMFI16M2D	845x320x700(33.3x12.6x27.6)	DA130S1C-20FZ
YN027GMFI16M3D	845x320x700(33.3x12.6x27.6)	DA150S1C-20FZ
YN036GMFI16M4D	990x345x965(39x13.6x38)	TNB306FPGMC-L

2. Features

Outdoor unit

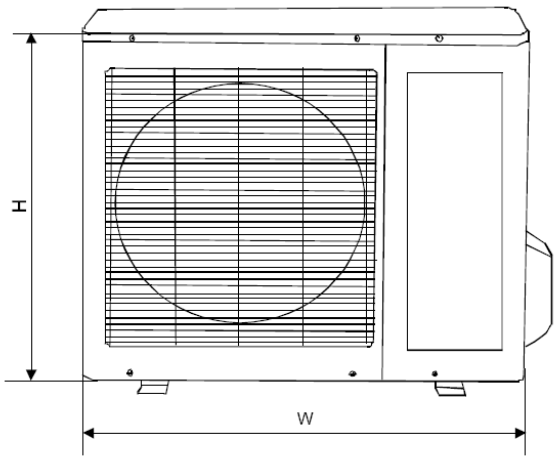
- **Power relay control**
- **Low noise air flow system**
- **Hydrophilic aluminum fin**

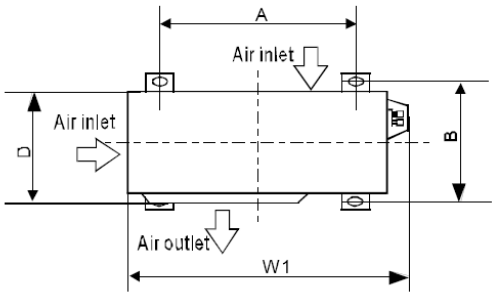
  The hydrophilic fin can improve the heating efficiency at operation mode.
- **4 way valve control**

  It is only operated in the heating operation mode except defrosting operation.
- **Anti-rust cabinet**
- **Valve protection cover**

  It protects the valves and prevents water from dripping.
- **Discharge pipe temperature protection**
- **Compressor crankcase heater**

3. Dimensions



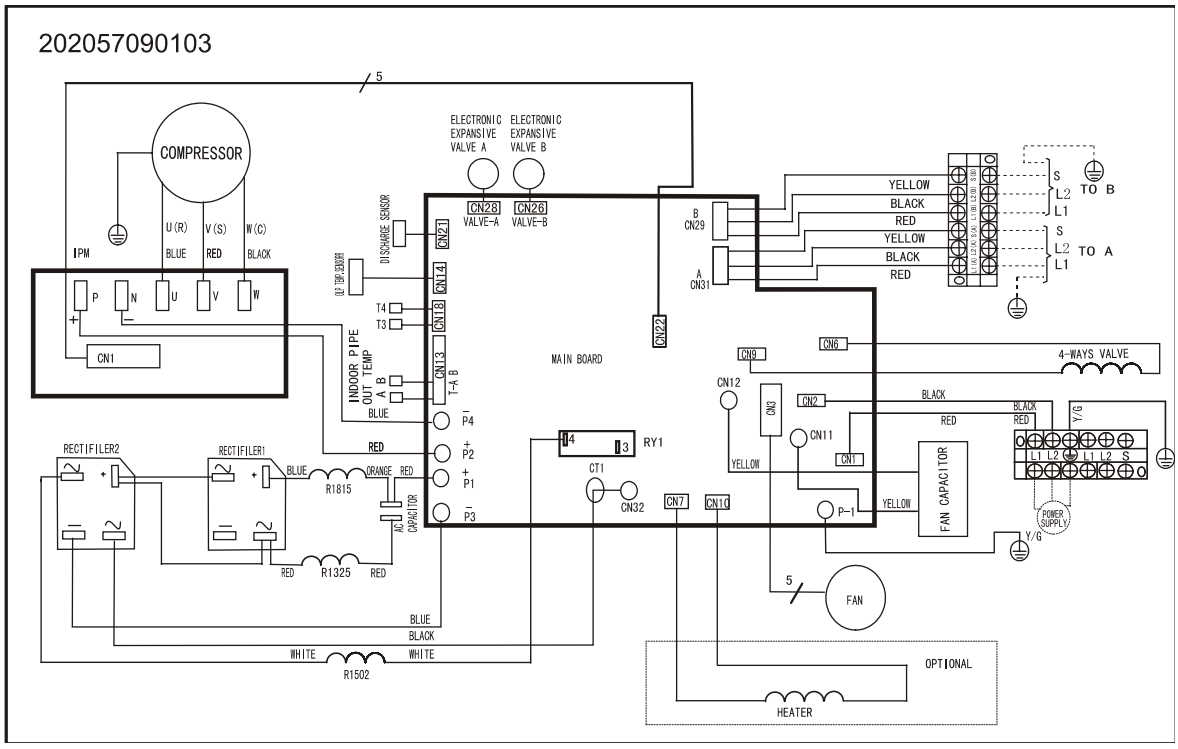


mm(in)

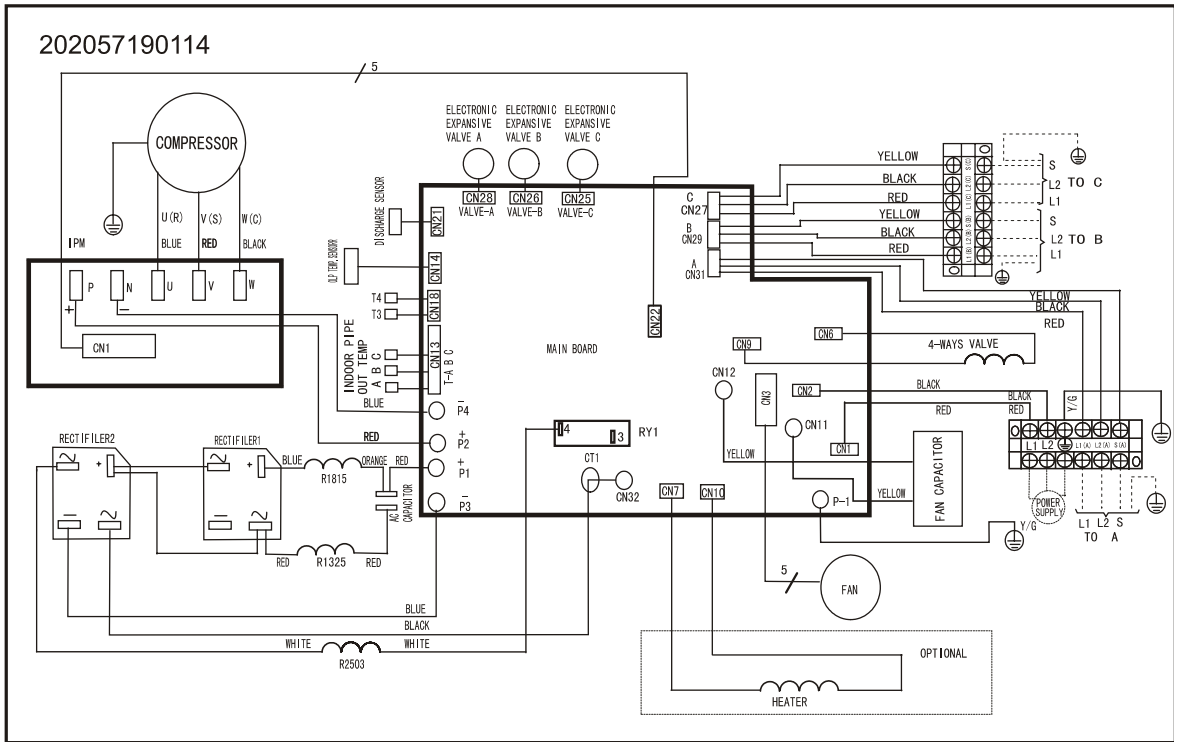
Model	W	D	H	W1	A	B
YN018GMFI16M2D	845((33.3)	320(12.6)	700(27.6)	908(35.7)	560(22)	335(13.2)
YN027GMFI16M3D						
YN036GMFI16M4D	990(39)	345(13.6)	965(38)	1075(42.3)	624(24.6)	366(14.4)

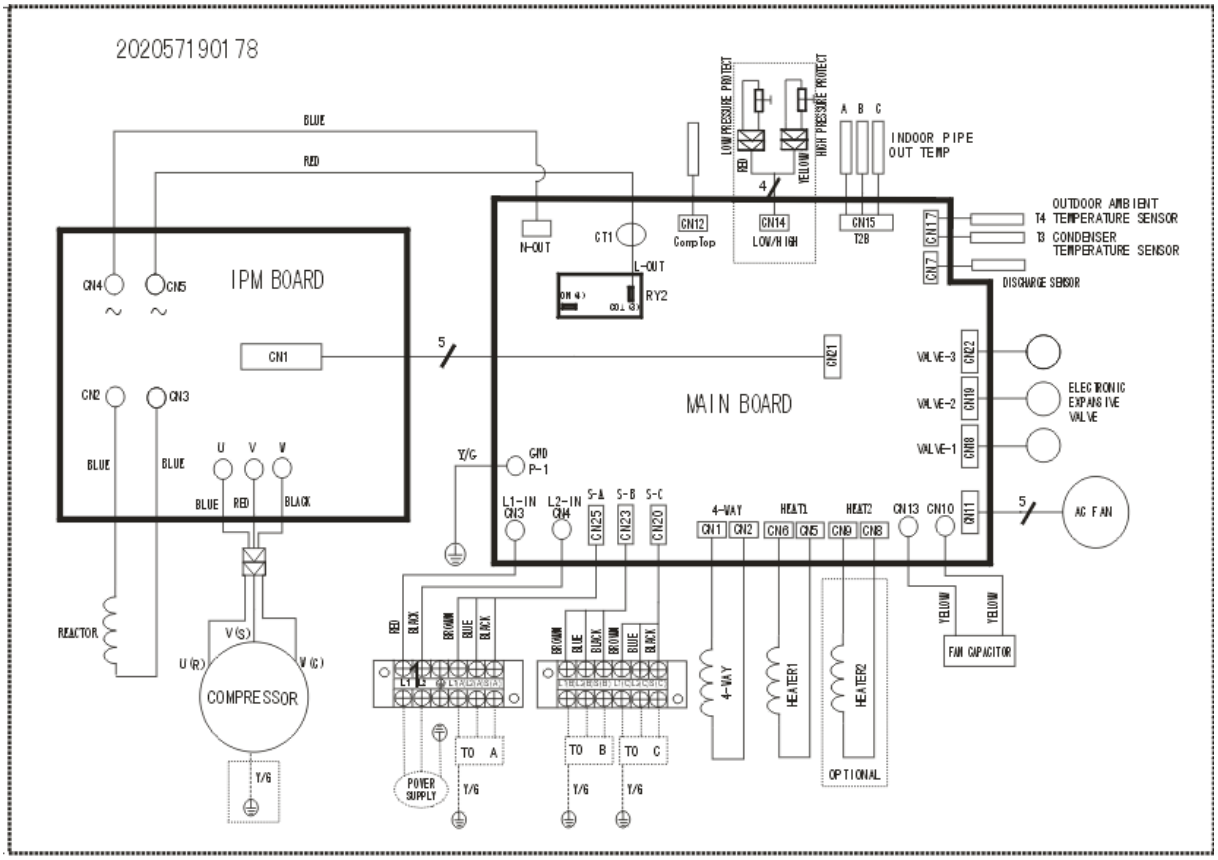
4. Wiring Diagram

4.1 YN018GMFI16M2D

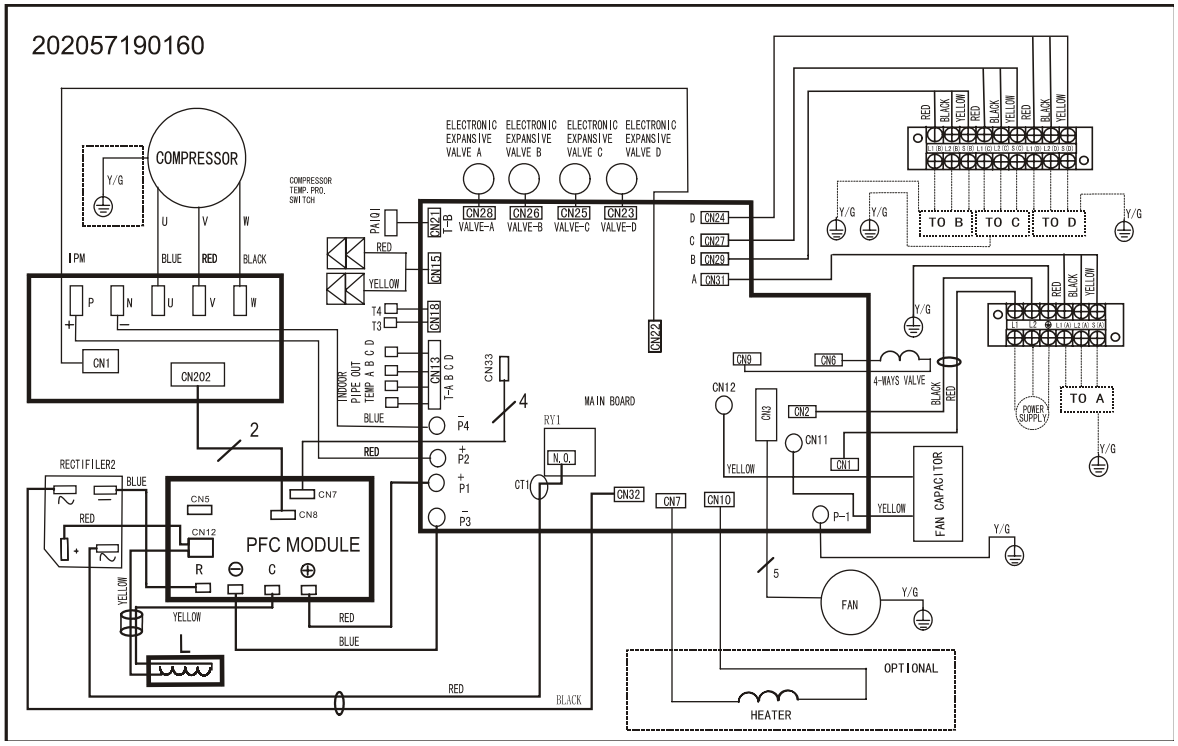


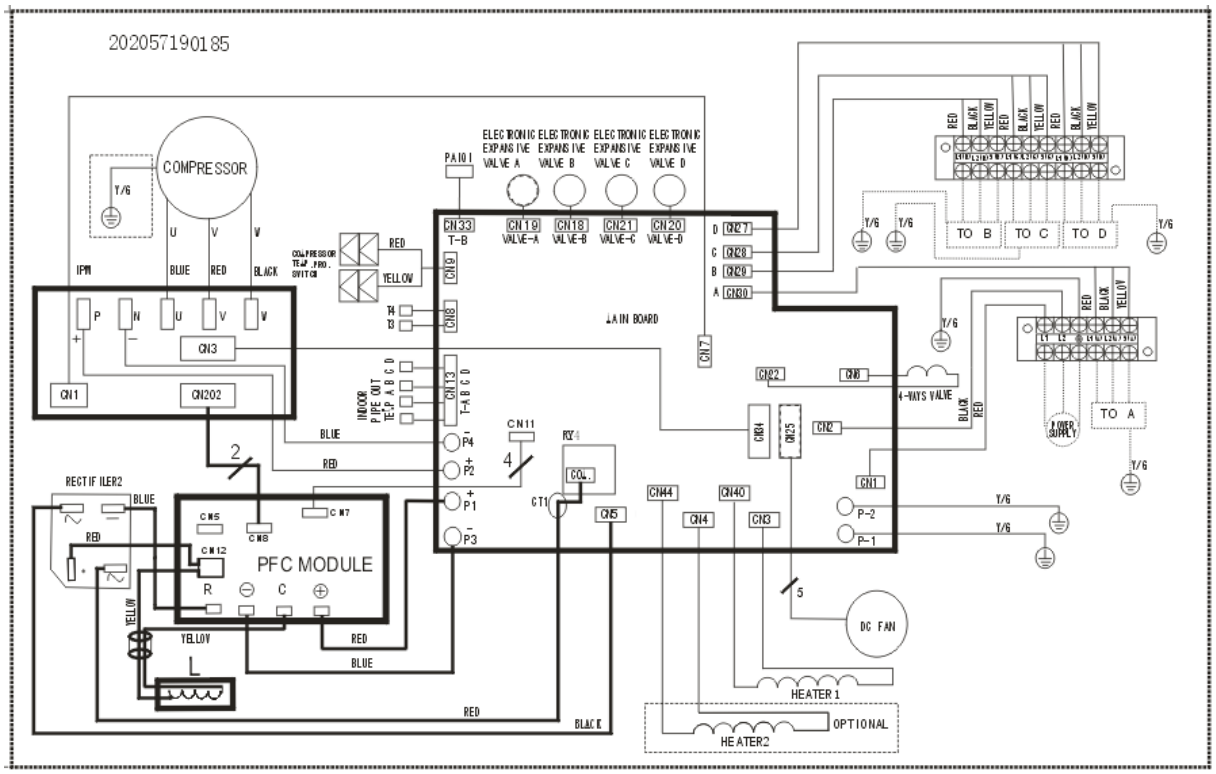
4.2 YN027GMFI16M3D





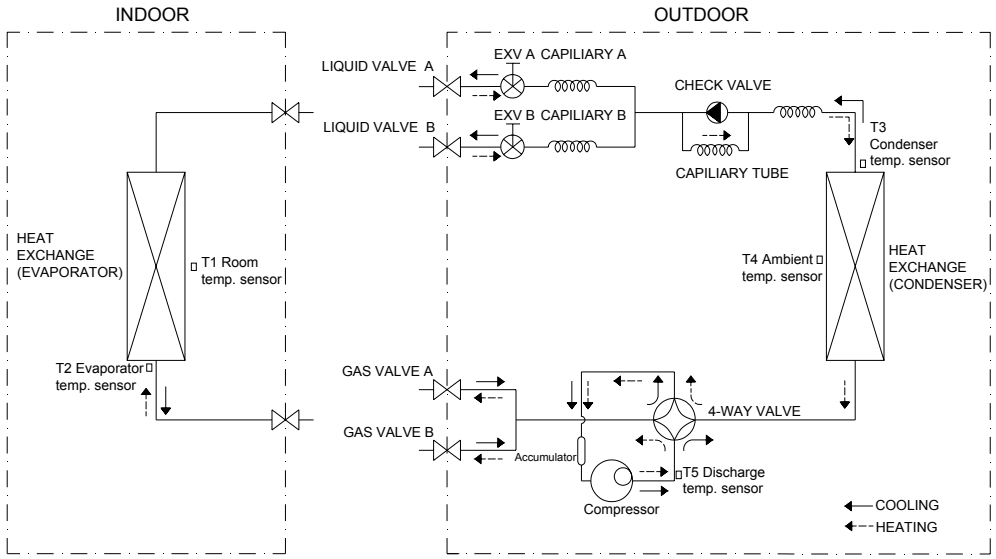
4.3 **YN036GMFI16M3D**



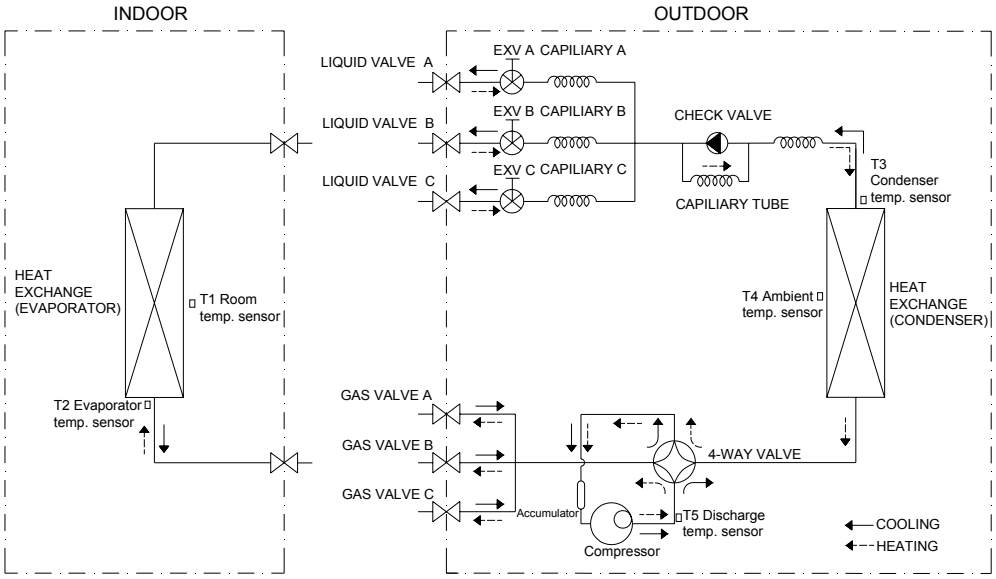


5. Refrigeration Cycle Diagram

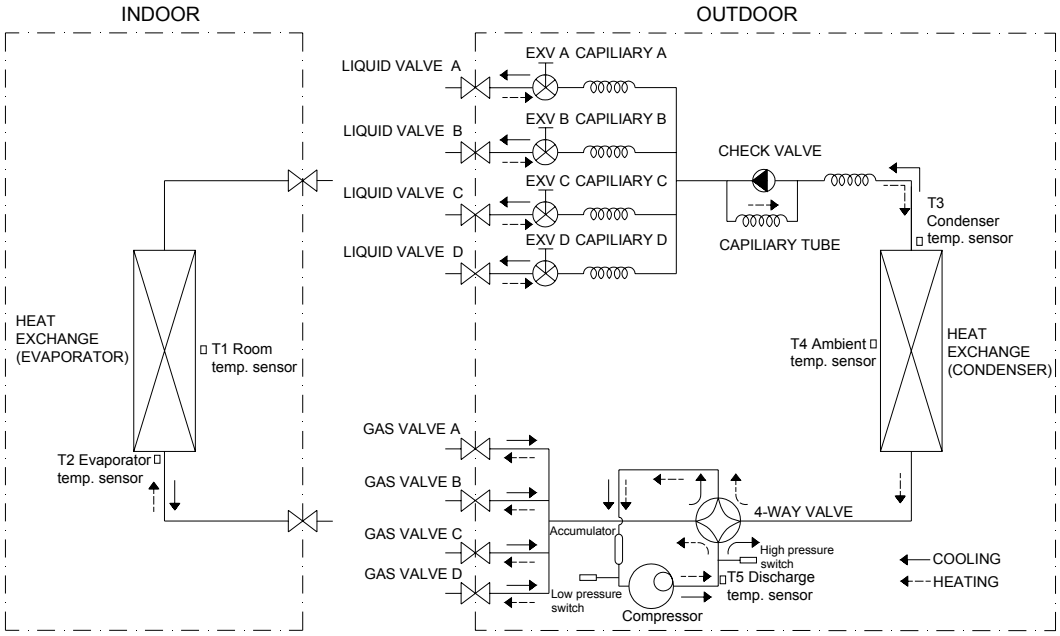
5.1Refrigeration circuit drawing of inverter dual-zone



5.2 Refrigeration circuit drawing of inverter tri-zone



5.3 Refrigeration circuit drawing of inverter quad-zone



6. Indoor units combination

6.1 Indoor unit combination for **YN018GMFI16M2D**

Comb.	Combinations	
	Unit A	Unit B
Dual(1x1)	9k	—
	12k	—
	18k	—
Dual (1x2)	9k	9k
	9k	12k
	12k	12k

6.2 Indoor unit combination for YN027GMFI16M3D

Comb.	Combinations		
	Unit A	Unit B	Unit C
TRI (1x1)	9k	—	—
	12k	—	—
	18k	—	—
TRI (1x2)	9k	9k	—
	9k	12k	—
	9k	18k	—
	12k	12k	—
	12k	18k	—
TRI (1x3)	9k	9k	9k
	9k	9k	12k
	9k	12k	12k

6.3 Indoor unit combination for YN036GMFI16M4D

Comb.	Combinations			
	Unit A	Unit B	Unit C	Unit D
QUA (1x1)	9k	—	—	—
	12k	—	—	—
	18k	—	—	—
QUA (1x2)	9k	9k	—	—
	9k	12k	—	—
	9k	18k	—	—
	12k	12k	—	—
	12k	18k	—	—
	18k	18k	—	—
QUA (1x3)	9k	9k	9k	—
	9k	9k	12k	—
	9k	9k	18k	—
	9k	12k	12k	—
	9k	12k	18k	—
	9k	18k	18k	—
	12k	12k	12k	—
	12k	12k	18k	—
	12k	18k	18k	—
QUA(1x4)	9k	9k	9k	9k
	9k	9k	9k	12k
	9k	9k	9k	18k
	9k	9k	12k	12k
	9k	9k	12k	18k
	9k	12k	12k	12k
	9k	12k	12k	18k
	12k	12k	12k	12k
	12k	12k	12k	18k

7. Installation Details

7.1 Wrench torque sheet for installation

Outside diameter		Torque	Additional tightening torque
mm	inch	N.cm	N.cm
Φ6.35	1/4	1500(153kgf.cm)	1600(163kgf.cm)
Φ9.52	3/8	2500(255kgf.cm)	2600(265kgf.cm)
Φ12.7	1/2	3500(357kgf.cm)	3600(367kgf.cm)

7.2 Connecting the cables

The power cord of connect should be selected according to the following specifications sheet.

For power line:

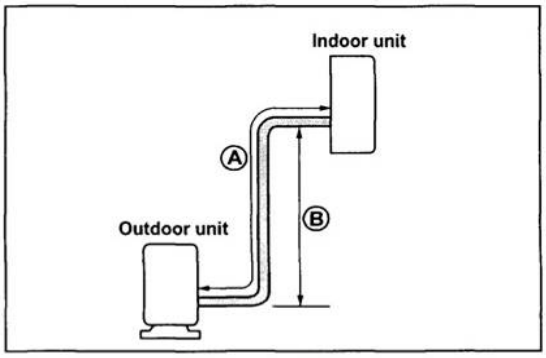
Unit	AWG
Dual-zone(18K outdoor unit)	14
Tri-zone (27K outdoor unit).	14
Quad-zone(36K outdoor unit)	12

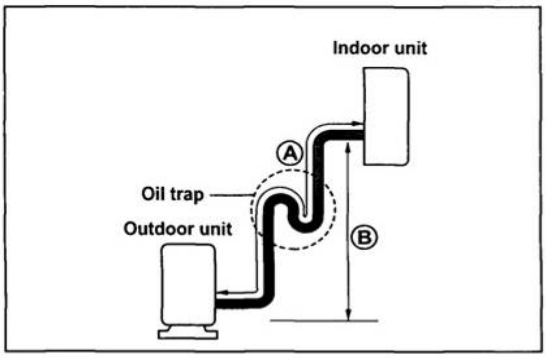
For indoor unit and outdoor unit connection line, 16AWG is ok for all.

7.3 Pipe length and the elevation

Unit	**Pipe size**		**Standard length (m)**	**Max. Elevation B (m)**	**Max. Length A (m)**	**Additional refrigerant (g/m)**
	Gas	**Liquid**				
9K	3/8" (Φ9.52)	1/4" (Φ6.35)	5 (16.4ft)	10 (33ft)	15 (49.2ft)	20 (0.212 ozs/ft)
12K/18K	1/2" (Φ12.7)	1/4" (Φ6.35)				

Total length for all rooms	Dual-zone**(m)**	Tri-zone**(m)**	Quad-zone**(m)**
	30(98ft)	45(150ft)	60(200ft)





Caution:

Capacity test is based on standard length and maximum allowance length is based on reliability.

Oil trap should be installed per 3-5 meters.

7.4 Installation for the first time

Air and moisture in the refrigerant system have undesirable effects as below:

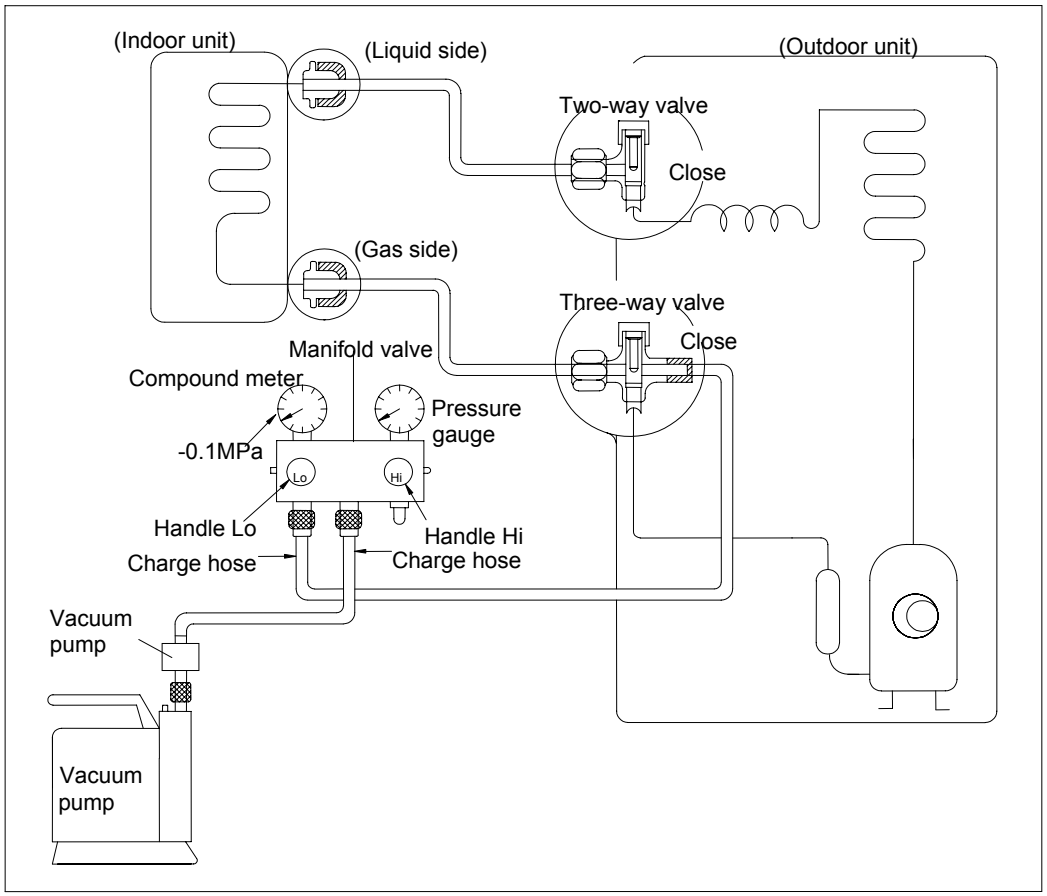
- Pressure in the system rises.
- Operating current rises.
- Cooling or heating efficiency drops.
- Moisture in the refrigerant circuit may freeze and block capillary tubing.
- Water may lead to corrosion of parts in the refrigerant system.

Therefore, the indoor units and the pipes between indoor and outdoor units must be leak tested and evacuated to remove gas and moisture from the system.

Gas leak check (Soap water method):

Apply soap water or a liquid neutral detergent on the indoor unit connections or outdoor unit connections by a soft brush to check for leakage of the connecting points of the piping. If bubbles come out, the pipes have leakage.

1. Air purging with vacuum pump



1) Completely tighten the flare nuts of the indoor and outdoor units, confirm that both the 2-way and 3-way valves are set to the closed position.
2) Connect the charge hose with the push pin of handle lo to the 3-way valves gas service port..
3) Connect the charge hose of handle hi connection to the vacuum pump.
4) Fully open the handle Lo of the manifold valve.
5) Operate the vacuum pump to evacuate.
6) Make evacuation for 30 minutes and check whether the compound meter indicates -0.1Mpa. If

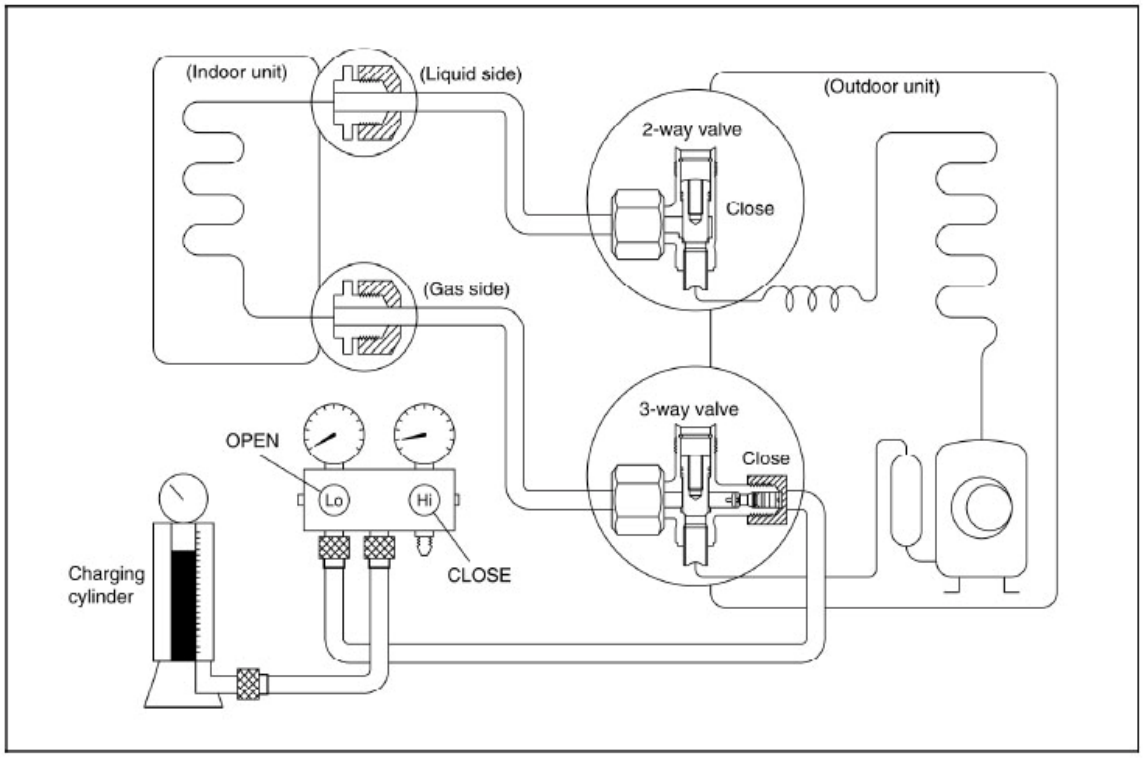
the meter does not indicate -0.1Mpa after pumping 30 minutes, it should be pumped 20 minutes more. If the pressure can't achieve -0.1Mpa after pumping 50 minutes, please check if there are some leakage points.

Fully close the handle Lo valve of the manifold valve and stop the operation of the vacuum pump. Confirm that the gauge needle does not move (approximately 5 minutes after turning off the vacuum pump).

7) Turn the flare nut of the 3-way valves about 45° counterclockwise for 6 or 7seconds after the gas coming out, then tighten the flare nut again. Make sure the pressure display in the pressure indicator is a little higher than the atmosphere pressure. Then remove the charge hose from the 3 way valve.

8) Fully open the 2 way valve and 3 way valve and securely tighten the cap of the 3 way valve.

2. Air purging by refrigerant



Procedure:

1). Confirm that both the 2-way and 3-way valves are set to the closed position.

2). Connect the charge set and a charging cylinder to the service port of the 3-way valve.

3). Air purging.

Open the valves on the charging cylinder and the charge set. Purge the air by loosening the flare nut on the 2-way valve approximately 45' for 3 seconds then closing it for 1 minute; repeat 3 times.

After purging the air, use a torque wrench to tighten the flare nut on the 2-way valve.

4). Check the gas leakage.

Check the flare connections for gas leakage.

5). Discharge the refrigerant.

Close the valve on the charging cylinder and discharge the refrigerant by loosening the flare nut on the 2-way valve approximately 45’ until the gauge indicates 0.3 to 0.5 Mpa.

6). Disconnect the charge set and the charging cylinder, and set the 2-way and 3-way valves to the open position.

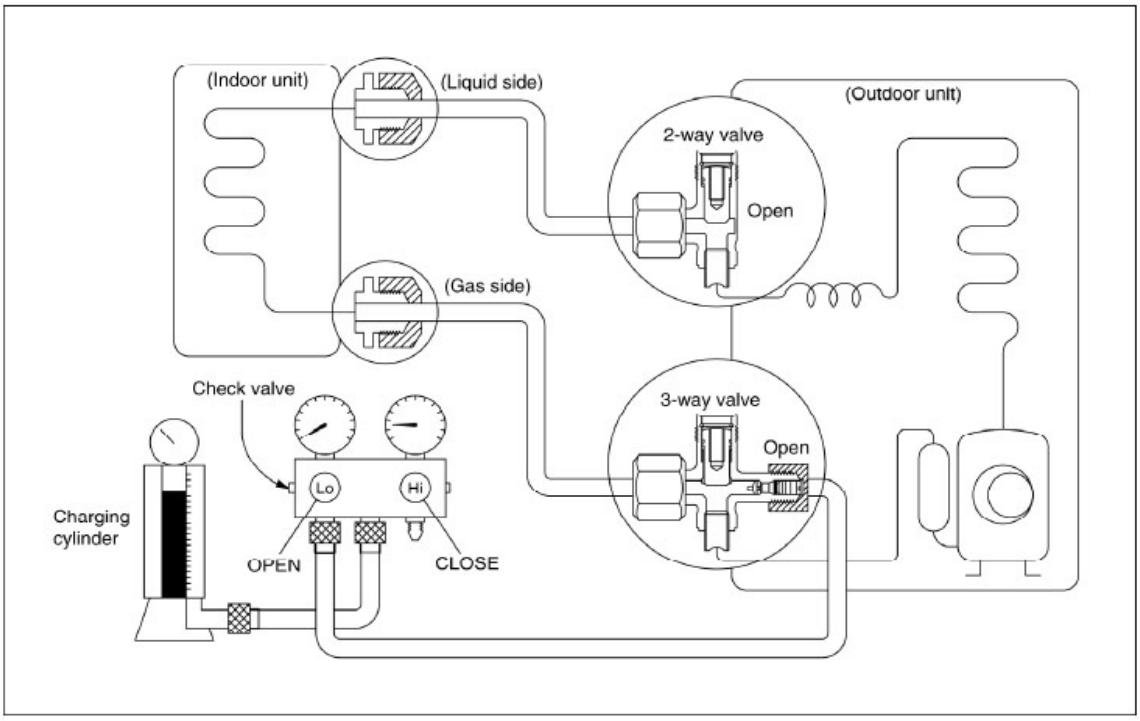
Be sure to use a hexagonal wrench to operate the valve stems.

7). Mount the valve stems nuts and the service port cap.

Be sure to use a torque wrench to tighten the service port cap to a torque 18N·m.

Be sure to check the gas leakage.

3. Adding the refrigerant if the pipe length >5m



Procedure:

1). Connect the charge hose to the charging cylinder, open the 2-way valve and the 3-way valve.

Connect the charge hose which you disconnected from the vacuum pump to the valve at the bottom of the cylinder. If the refrigerant is R410A, make the cylinder bottom up to ensure the liquid charge.

2). Purge the air from the charge hose.

Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air (be careful of the liquid refrigerant).

3) Put the charging cylinder onto the electronic scale and record the weight.

4) Operate the air conditioner at the cooling mode.

5) Open the valves (Low side) on the charge set and charge the system with liquid refrigerant.

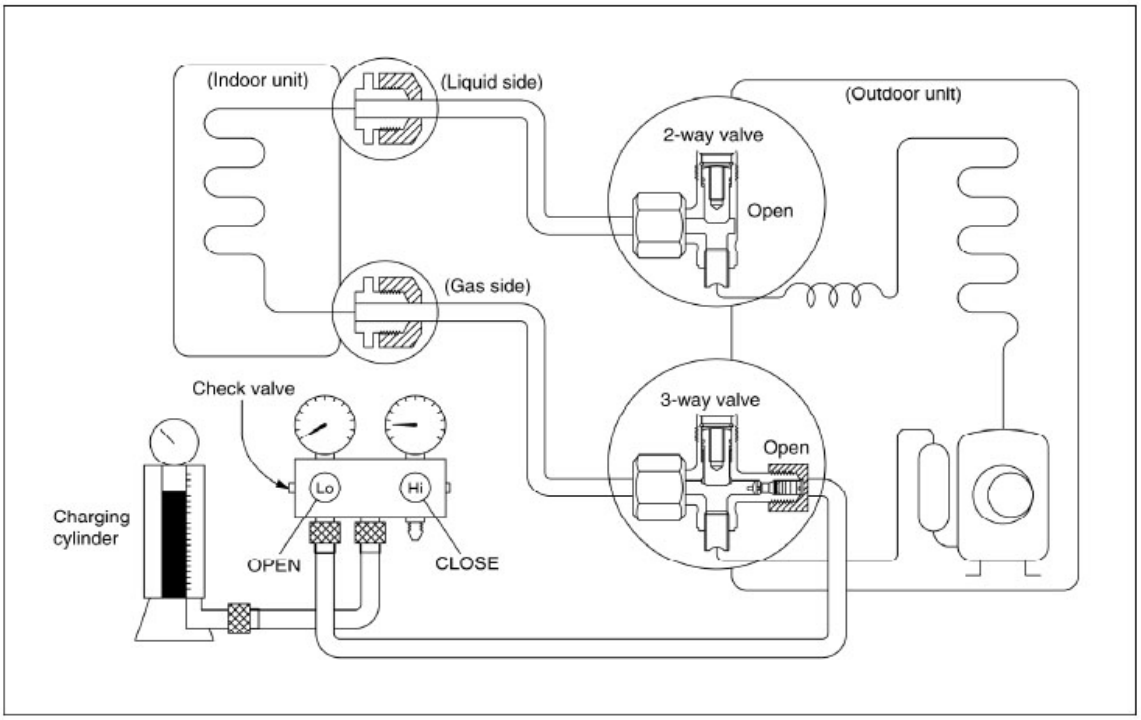
6).When the electronic scale displays the proper weight (refer to the table), disconnect the charge hose from the 3-way valve's service port immediately and turn off the air conditioner before disconnecting the hose.

7). Mount the valve stem caps and the service port

Use torque wrench to tighten the service port cap to a torque of 18N.m.

Be sure to check for gas leakage.

7.5 Adding the refrigerant after running the system for many years



Procedure:

1). Connect the charge hose to the 3-way service port, open the 2-way valve and the 3-way valve.

Connect the charge hose to the valve at the bottom of the cylinder. If the refrigerant is R410A, make the cylinder bottom up to ensure liquid charge.

2). Purge the air from the charge hose.

Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air (be careful of the liquid refrigerant).

3) Put the charging cylinder onto the electronic scale and record the weight.

4) Operate the air conditioner at the cooling mode.

5) Open the valves (Low side) on the charge set and charge the system with liquid refrigerant.

6).When the electronic scale displays the proper weight (refer to the gauge and the pressure of the low side), disconnect the charge hose from the 3-way valve's service port immediately and turn off the air

conditioner before disconnecting the hose.

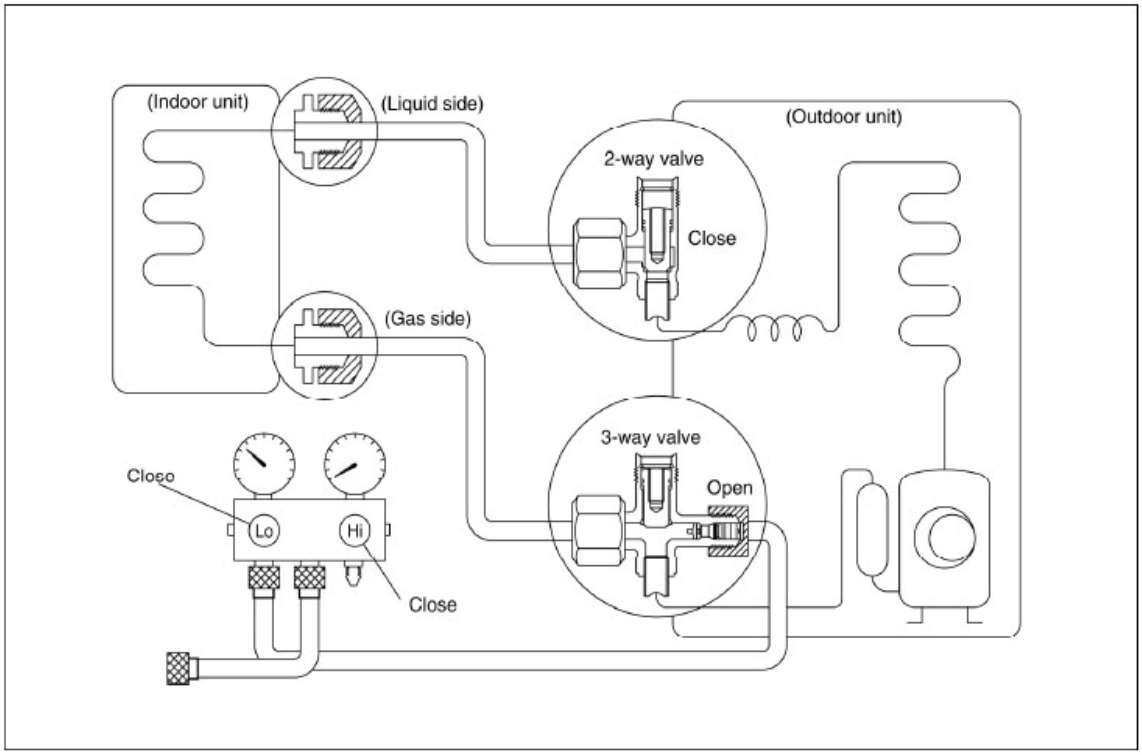
7). Mount the valve stem caps and the service port

Use torque wrench to tighten the service port cap to a torque of 18N.m.

Be sure to check for gas leakage.

7.6 Re-installation while the indoor unit need to be repaired

1. Collecting the refrigerant into the outdoor unit



Procedure

1). Confirm that both the 2-way and 3-way valves are set to the opened position

Remove the valve stem caps and confirm that the valve stems are in the opened position.

Be sure to use a hexagonal wrench to operate the valve stems.

2). Connect the charge hose with the push pin of handle lo to the 3-way valves gas service port.

3). Air purging of the charge hose.

Open the handle Lo valve of the manifold valve slightly to purge air from the charge hose for 5 seconds and then close it quickly.

4). Set the 2-way valve to the close position.

5). Operate the air conditioner at the cooling cycle and stop it when the gauge indicates 0.1MPa.

6). Set the 3-way valve to the closed position immediately

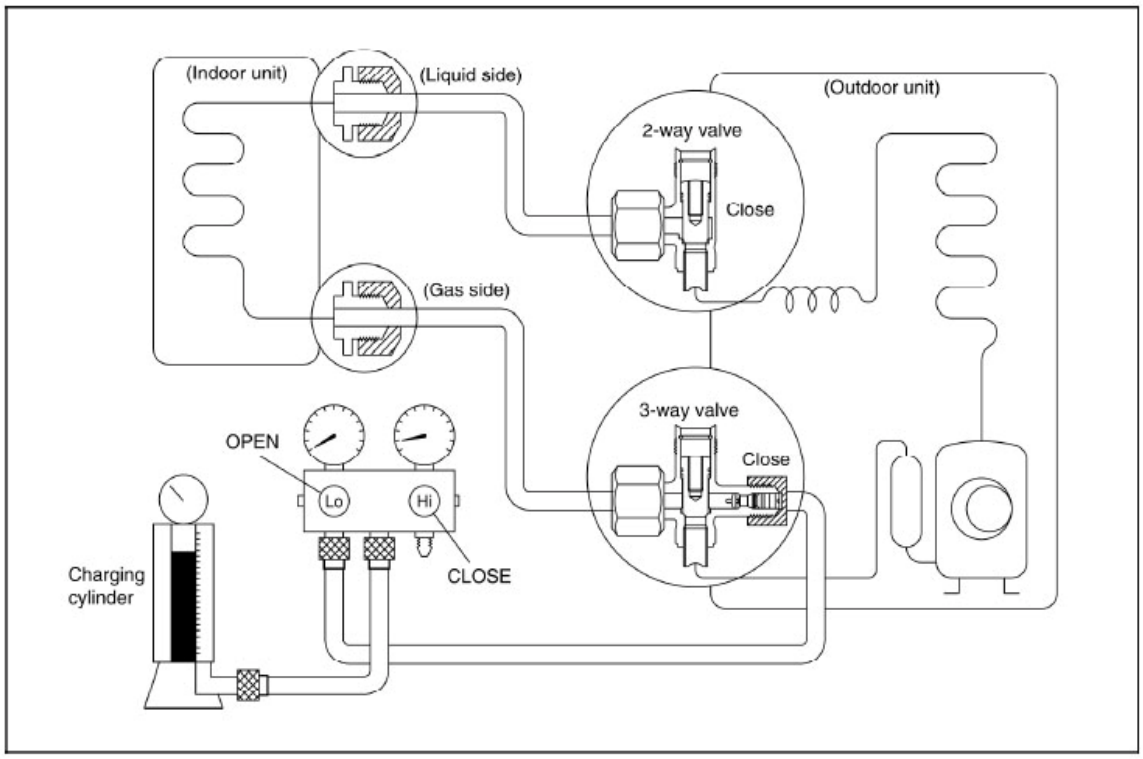
Do this quickly so that the gauge ends up indicating 0.3 to 0.5Mpa.

Disconnect the charge set, and tighten the 2-way and 3-way valve's stem nuts.

Use a torque wrench to tighten the 3-way valves service port cap to a torque of 1.8 kgf.m.

Be sure to check for gas leakage.

2. Air purging by the refrigerant



Procedure:

1). Confirm that both the 2-way and 3-way valves are set to the closed position.

2). Connect the charge set and a charging cylinder to the service port of the 3-way valve

Leave the valve on the charging cylinder closed.

3). Air purging.

Open the valves on the charging cylinder and the charge set. Purge the air by loosening the flare nut on the 2-way valve approximately 45' for 3 seconds then closing it for 1 minute; repeat 3 times.

After purging the air, use a torque wrench to tighten the flare nut on the 2-way valve.

4). Check the gas leakage

Check the flare connections for gas leakage.

5). Discharge the refrigerant.

Close the valve on the charging cylinder and discharge the refrigerant by loosening the flare nut on the 2-way valve approximately 45' until the gauge indicates 0.3 to 0.5 Mpa.

6). Disconnect the charge set and the charging cylinder, and set the 2-way and 3-way valves to the open position

Be sure to use a hexagonal wrench to operate the valve stems.

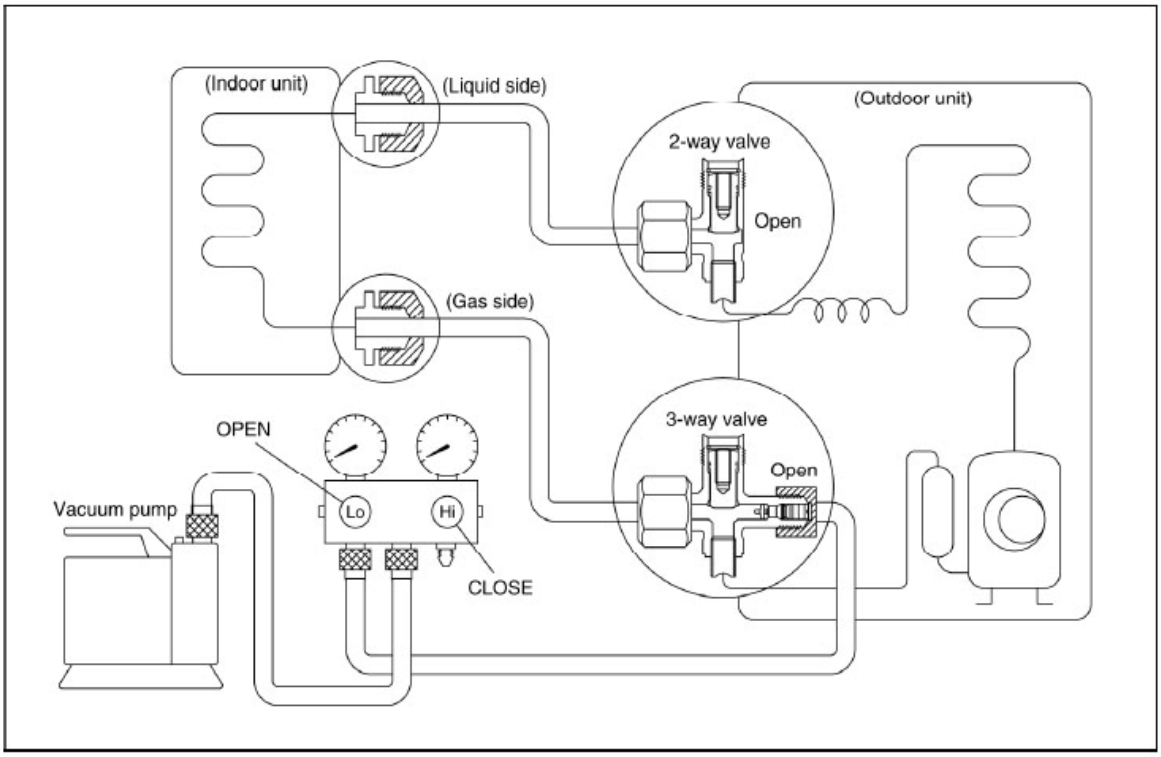
7). Mount the valve stems nuts and the service port cap

Be sure to use a torque wrench to tighten the service port cap to a torque 18N.m.

Be sure to check the gas leakage.

7.7 Re-installation while the outdoor unit need to be repaired

1. Evacuation for the whole system



Procedure:

1). Confirm that both the 2-way and 3-way valves are set to the opened position.

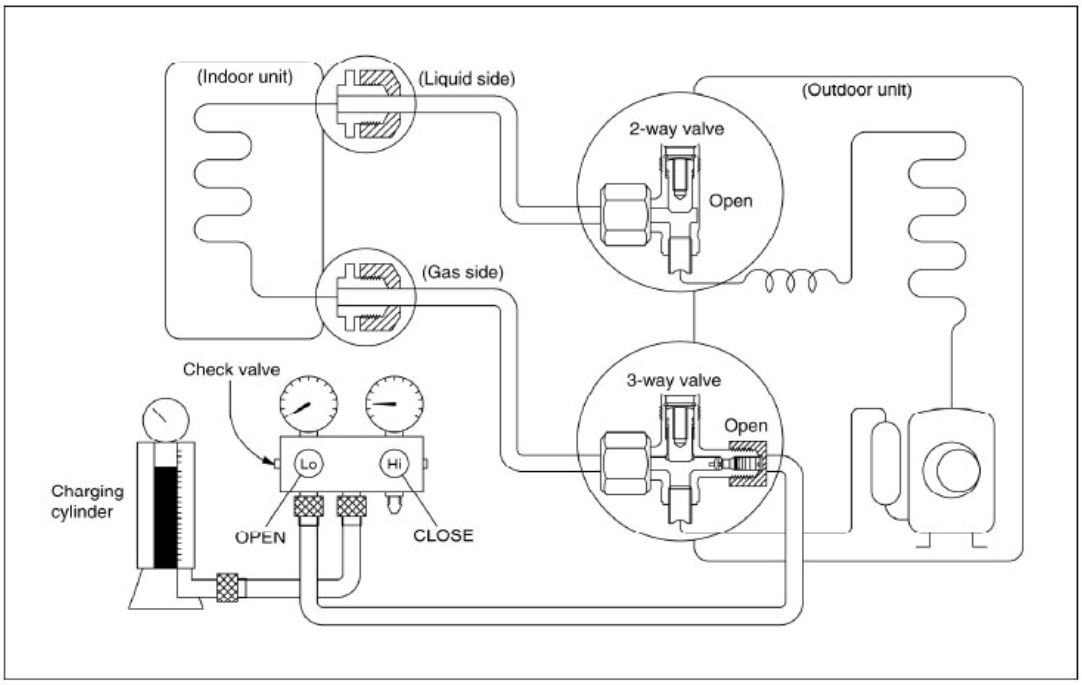
2). Connect the vacuum pump to 3-way valve's service port.

3). Evacuation for approximately one hour. Confirm that the compound meter indicates -0.1Mpa.

4). Close the valve (Low side) on the charge set, turn off the vacuum pump, and confirm that the gauge needle does not move (approximately 5 minutes after turning off the vacuum pump).

5). Disconnect the charge hose from the vacuum pump.

2. Refrigerant charging



Procedure:

1). Connect the charge hose to the charging cylinder, open the 2-way valve and the 3-way valve
Connect the charge hose which you disconnected from the vacuum pump to the valve at the bottom of the cylinder. If the refrigerant is R410A, make the cylinder bottom up to ensure liquid charge.

2). Purge the air from the charge hose

Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air (be careful of the liquid refrigerant).

3) Put the charging cylinder onto the electronic scale and record the weight.

4). Open the valves (Low side) on the charge set and charge the system with liquid refrigerant

If the system cannot be charge with the specified amount of refrigerant, or can be charged with a little at a time (approximately 150g each time) , operating the air conditioner in the cooling cycle; however, one time is not sufficient, wait approximately 1 minute and then repeat the procedure.

5).When the electronic scale displays the proper weight, disconnect the charge hose from the 3-way valve's service port immediately

If the system has been charged with liquid refrigerant while operating the air conditioner, turn off the air conditioner before disconnecting the hose.

6). Mounted the valve stem caps and the service port

Use torque wrench to tighten the service port cap to a torque of 18N.m.

Be sure to check for gas leakage

8. Electronic control function

8.1 Abbreviation

T1: Indoor ambient temperature

T2: Coil temperature of indoor heat exchanger middle.

T2B: Coil temperature of indoor heat exchanger outlet.

T3: Coil temperature of outdoor heat exchanger

T4: Outdoor ambient temperature

T5: Compressor discharge temperature

Ts: Setting temp.

8.2 Electric control working environment.

8.2.1 Input voltage: 230V.

8.2.2 Input power frequency:60Hz.

8.2.3 Indoor fan normal working amp. is less than 1A.

8.2.4 Outdoor fan. Normal working amp. is less than 1.5A.

8.2.5 Four-way valve normal working amp. is less than 1A.

8.2.6 Swing motor: DC12V.

8.3 Outdoor unit's digital display tube

There is a digital display tube in outdoor PCB.

Digital display tube display function

- In standby , the LED displays "- -"
- In compressor operation, the LED display the running frequency,
- In defrosting mode, The LED displays "dF" or alternative displays between running frequency and "dF"(each displays 2s)
- In compressor pre-heating, The LED displays "- -"
- In protection or malfunction, the LED displays error code or protection code.

8.4 Outdoor unit point check function

There is a check switch in outdoor PCB.

Push the switch SW1 to check the states of unit when the unit is running. The digital display tube will display the follow procedure when push SW1 each time.

	Display	Remark
1	Indoor unit capacity demand code	
2	Outdoor unit running mode code	Off:0, Cooling:1, Heating:2
3	Amendatory capacity demand code	
4	Outdoor unit fan motor state	Off:0, Low speed:1, High speed:2
5	Evaporator outlet temp. for 1# indoor unit	Actual data,(If the temp. is lower than -9 degree, the digital display tube will show "-9".If the temp. is higher than 70 degree, the digital display tube will show "70". If the indoor unit is not connected, the digital display tube will show: "——")
6	Evaporator outlet temp. for 2# indoor unit	
7	Evaporator outlet temp. for 3# indoor unit	
8	Evaporator outlet temp. for 4# indoor unit	
9	Condenser pipe temp. (T3)	
10	Outdoor ambient temp.(T4)	
11	Compressor discharge temp.(Tp)	Actual data (If the temp. is lower than 0 degree, the digital display tube will show "0".If the temp. is higher than 99 degree, the digital display tube will show single digit and tens digit. (For example, the digital display tube show "0.5",it means the

		compressor discharge temp. is 105 degree. If the indoor unit is not connected, the digital display tube will show: “——”)
12	Inverter current	AD data
13	EXV open angle for 1# indoor unit	Actual data divide 8
14	EXV open angle for 2# indoor unit	Actual data divide 8
15	EXV open angle for 3# indoor unit	Actual data divide 8
16	EXV open angle for 4# indoor unit	Actual data divide 8
17	Power supply of outdoor unit	AD data(AD data*472/255=actual data)
18	Indoor unit number	The indoor unit can communicate with outdoor unit well.
19	The last error or protection code	00 means no malfunction
20	frequency value	Actual data
21	Ambient temp. of 1# indoor unit	Actual data
22	Condenser pipe temp. of 1# indoor unit	Actual data
23	Ambient temp. of 2# indoor unit	Actual data
24	Condenser pipe temp. of 2# indoor unit	Actual data
25	Ambient temp. of 3# indoor unit	Actual data
26	Condenser pipe temp. of 3# indoor unit	Actual data
27	Ambient temp. of 4# indoor unit	Actual data
28	Condenser pipe temp. of 4# indoor unit	Actual data
29	——	Check point over

For YN027GMFI16M3D and YN036GMFI16M4D models:

	Display	Remark
1	No. of indoor units in good connection	Actual data
2	Outdoor unit running mode code	Off:0, Cooling:2, Heating:3, Forced cooling:4
3	A indoor unit capacity	The capacity unit is horse power. If the indoor unit is not connected, the digital display tube will show: “——”
4	B indoor unit capacity	
5	C indoor unit capacity	
6	D indoor unit capacity	
7	E indoor unit capacity	
8	A Indoor unit capacity demand code	
9	B Indoor unit capacity demand code	
10	C Indoor unit capacity demand code	
11	D Indoor unit capacity demand code	
12	E Indoor unit capacity demand code	
13	Total indoor units amendatory capacity demand code	
14	The frequency corresponding to the total indoor units amendatory capacity demand	
15	The frequency after the frequency limit	
16	The frequency sending to compressor control chip	
17	A indoor unit evaporator outlet temp.(T_{2B}A)	If the temp. is lower than -9 degree, the digital display tube will show “-9”.If the temp. is higher than 70 degree, the digital display tube will show “70”. If the indoor unit is not connected, the digital display tube will show: “——”
18	B indoor unit evaporator outlet temp.(T_{2B}B)	
19	C indoor unit evaporator outlet temp.(T_{2B}C)	
20	D indoor unit evaporator outlet temp.(T_{2B}D)	
21	E indoor unit evaporator outlet temp.(T_{2B}E)	
22	A indoor unit room temp.(T_1A)	
23	B indoor unit room temp.(T_1B)	

<table>
<tr><td>24</td><td>C indoor unit room temp.(T_1C)</td><td colspan="3" rowspan="3"></td></tr>
<tr><td>25</td><td>D indoor unit room temp.(T_1D)</td></tr>
<tr><td>26</td><td>E indoor unit room temp.(T_1E)</td></tr>
<tr><td>27</td><td>A indoor unit evaporator outlet temp.($T_{2B}A$)</td><td colspan="3" rowspan="7">If the temp. is lower than -9 degree, the digital display tube will show “-9”.If the temp. is higher than 70 degree, the digital display tube will show “70”. If the indoor unit is not connected, the digital display tube will show: “——”</td></tr>
<tr><td>28</td><td>B indoor unit evaporator outlet temp.($T_{2B}B$)</td></tr>
<tr><td>29</td><td>C indoor unit evaporator outlet temp.($T_{2B}C$)</td></tr>
<tr><td>30</td><td>D indoor unit evaporator outlet temp.($T_{2B}D$)</td></tr>
<tr><td>31</td><td>E indoor unit evaporator outlet temp.($T_{2B}E$)</td></tr>
<tr><td>32</td><td>Condenser pipe temp.(T3)</td></tr>
<tr><td>33</td><td>Outdoor ambient temp.(T4)</td></tr>
<tr><td>34</td><td>Compressor discharge temp.(Tp)</td><td colspan="3">The display value is between 30~120 degree. If the temp. is lower than 30 degree, the digital display tube will show “30”.If the temp. is higher than 99 degree, the digital display tube will show single digit and tens digit. For example, the digital display tube show “0.5”,it means the compressor discharge temp. is 105 degree.)</td></tr>
<tr><td>35</td><td>AD value of current</td><td colspan="3" rowspan="2">The display value is hex number.</td></tr>
<tr><td>36</td><td>AD value of voltage</td></tr>
<tr><td>37</td><td>EXV open angle for A indoor unit</td><td colspan="3" rowspan="5">Actual data/4.
If the value is higher than 99, the digital display tube will show single digit and tens digit.
For example ,the digital display tube show “2.0”,it means the EXV open angle is 120×4=480p.)</td></tr>
<tr><td>38</td><td>EXV open angle for B indoor unit</td></tr>
<tr><td>39</td><td>EXV open angle for C indoor unit</td></tr>
<tr><td>40</td><td>EXV open angle for D indoor unit</td></tr>
<tr><td>41</td><td>EXV open angle for E indoor unit</td></tr>
<tr><td rowspan="8">42</td><td rowspan="8">Frequency limit symbol</td><td>Bit7</td><td>0</td><td rowspan="8">The display value is hex number. For example, the digital display tube show 2A,then Bit5=1, Bit3=1, Bit1=1. It means frequency limit caused by T4,T3 and current.</td></tr>
<tr><td>Bit6</td><td>0</td></tr>
<tr><td>Bit5</td><td>Frequency limit caused by T4.</td></tr>
<tr><td>Bit4</td><td>Frequency limit caused by T2.</td></tr>
<tr><td>Bit3</td><td>Frequency limit caused by T3.</td></tr>
<tr><td>Bit2</td><td>Frequency limit caused by Tp.</td></tr>
<tr><td>Bit1</td><td>Frequency limit caused by current</td></tr>
<tr><td>Bit0</td><td>Frequency limit caused by voltage</td></tr>
<tr><td>43</td><td>Average value of T2</td><td colspan="3">(Sum T2 value of all indoor units)/(indoor units number)</td></tr>
<tr><td>44</td><td>Outdoor unit fan motor state</td><td colspan="3">Off:0, High speed:1, Med speed:2, Low speed:3</td></tr>
<tr><td>45</td><td>The last error or protection code</td><td colspan="3">00 means no malfunction</td></tr>
</table>

The following items from 6.4.1 to 6.4.6 are for the explanation of the point check functions.

8.4.1 Frequency of compressor:

Display	Frequency of compressor (Hz)
30	30
--	Stand by
60	60

8.4.2 Running mode:

Display	Corresponding mode
0	Off
1	Cooling mode
2	Heating mode

8.4.3 Capacity demand:

Cooling mode

Capacity	2000-2500	2000-2500	3000-3800	4500-5000	5000-5500	5500-6100	6100-7000	7000-7500	7500-8000	>7500
Corresponding Code	1	2	3	4	5	6	7	8	9	>=10

Heating mode

Capacity	2000-2500	2000-2500	3000-3800	4500-5000	5500-6100	6100-7000	6100-7000	7000-7500	7500-8000	>8000
Corresponding Code	1	2	3	4	5	6	7	8	9-10	>=11

Note:

The capacity is just for reference.

8.4.4Number of indoor unit

Display	Number of indoor unit
1	1
2	2
3	3
4	4

8.4.5 Opening degree of electronic expansion valve:

Actual opening degree equals the display data divided 8

8.5 Protection

8.5.1 Three minutes delay at restart for compressor.

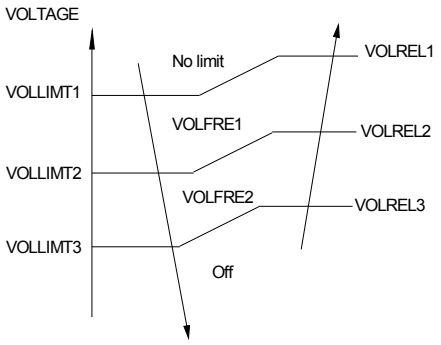
8.5.2 Temperature protection of compressor discharge.

When the compressor discharge temp. is getting higher, the running frequency will be limited as below rules:

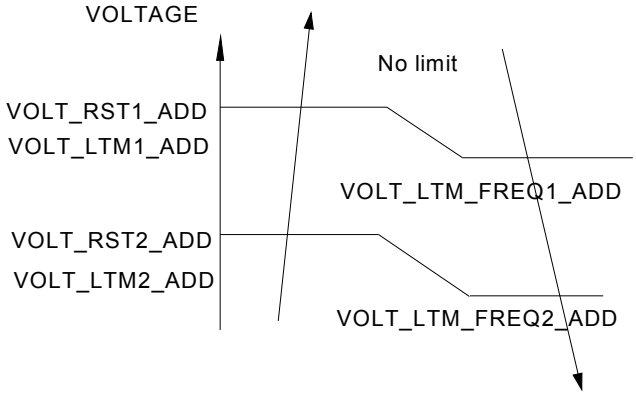
----If 102□<T5<115□, decrease the frequency to the lower level every 2 minutes till to F1.

---If T5>115□ for 10 seconds, the compressor will stop and restart till T5<90□.

8.5.3 Low voltage protection



For M3OC-27HRDN1-M(220057100510)、M4OC-36HRFN1-M (220057100530) model:



Note: if the low voltage protection occurs and not resumes within 3min, it will keep the protection always after restart the machine.

8.5.4 Compressor current limit protection

If the compressor current exceeds the current limit value for 10 seconds, the compressor frequency will be limited as below table.

Cooling mode:

Current frequency(Hz)	Current limit value(A)	Frequency limit
COOL_F10	ICOOLLMT6	Decrease the frequency to COOL_F4 and run at COOL_F4 for 3 minutes. After that, the frequency will be adjusted according to the capacity demand and rise to the upper level every 3 minutes (When the frequency>COOL_F4 via capacity demand).
COOL_F9	ICOOLLMT5	
COOL_F8	ICOOLLMT4	
COOL_F7	ICOOLLMT3	
COOL_F6	ICOOLLMT2	
COOL_F5	ICOOLLMT1	
If the current frequency is lower than COOL_F4, the frequency will not be limited. After 10s of the compressor start, if the current>ICOOL,the AC will display the failure for 30 seconds and stop. The AC will restart 3 minutes later.		

Heating mode:

Current frequency(Hz)	Current limit value(A)	Frequency limit
HEAT_F12	IHEATLMT8	Decrease the frequency to HEAT_F4 and run at HEAT_F4 for 3 minutes. After that, the frequency will be adjusted according to the capacity demand and rise to the upper level every 3 minutes (When the frequency>Heat_F4 via capacity demand).
HEAT_F11	IHEATLMT7	
HEAT_F10	IHEATLMT6	
HEAT_F9	IHEATLMT5	
HEAT_F8	IHEATLMT4	
HEAT_F7	IHEATLMT3	
HEAT_F6	IHEATLMT2	
HEAT_F5	IHEATLMT1	
If the current frequency is lower than HEAT_F4, the frequency will not be limited. After 10s of the compressor start, if the current>IHEAT,the AC will display the failure for 30 seconds and stop. The AC will restart 3 minutes later.		

For M3OC-27HRDN1-M(220057100510)、M4OC-36HRFN1-M (220057100530) model:

Cooling mode:

Current frequency（Hz）	Current limit value（A）	Frequency limit
COOL_F16	ICOOLLMT12	Decrease the frequency to COOL_F4 and run at COOL_F4 for 3 minutes. After that, the frequency will be adjusted according to the capacity demand and rise to the upper level every 3 minutes (When the frequency>COOL_F4 via capacity demand).
COOL_F15	ICOOLLMT11	
COOL_F14	ICOOLLMT10	
COOL_F13	ICOOLLMT9	
COOL_F12	ICOOLLMT8	
COOL_F11	ICOOLLMT7	
COOL_F10	ICOOLLMT6	
COOL_F9	ICOOLLMT5	
COOL_F8	ICOOLLMT4	
COOL_F7	ICOOLLMT3	
COOL_F6	ICOOLLMT2	
COOL_F5	ICOOLLMT1	
If the current frequency is lower than COOL_F4, the frequency will not be limited. After 10s of the compressor start, if the current>ICOOL, the AC will display the failure for 30 seconds and stop. The AC will restart 3 minutes later.		

Heating mode:

Current frequency（Hz）	Current limit value（A）	Frequency limit
HEAT_F16	IHEATLMT12	Decrease the frequency to HEAT_F4 and run at HEAT_F4 for 3 minutes. After that, the frequency will be adjusted according to the capacity demand and rise to the upper level every 3 minutes (When the frequency>Heat_F4 via capacity demand).
HEAT_F15	IHEATLMT11	
HEAT_F14	IHEATLMT10	
HEAT_F13	IHEATLMT9	
HEAT_F12	IHEATLMT8	
HEAT_F11	IHEATLMT7	
HEAT_F10	IHEATLMT6	
HEAT_F9	IHEATLMT5	
HEAT_F8	IHEATLMT4	
HEAT_F7	IHEATLMT3	
HEAT_F6	IHEATLMT2	
HEAT_F5	IHEATLMT1	
If the current frequency is lower than HEAT_F4, the frequency will not be limited. After 10s of the compressor start, if the current>IHEAT, the AC will display the failure for 30 seconds and stop. The AC will restart 3 minutes later.		

8.5.5 Indoor / outdoor units communication protection

If the indoor units can not receive the feedback signal from the outdoor units for 2 minutes, the AC will stop and display the failure.

8.5.6 High condenser coil temp. protection.

When T3>65□ for 3 seconds, the compressor will stop while the indoor fan and outdoor fan will continue.

When T3<52□, the protection will release and the compressor will restart after 3 minutes.

8.5.7 Outdoor unit anti-freezing protection

When T2B<0□ for 250 seconds, the indoor unit capacity demand will be zero and resume to normal when T2B>10□.

8.5.8 Oil return

Running rules:

1. If the compressor frequency keeps lower than RECOILINFRE for 2hours,the AC will rise the frequency to RECOILFRE for 3mins and then resume to former frequency.

Model	RECOILINFRE
YN018GMFI16M2D	45
YN027GMFI16M3D	45
YN036GMFI16M4D	40

2. During the oil return process, the EXV and indoor units keep the current running mode, the frequency will not be limited by the compressor discharge temp. and the current.

8.5.9 Compressor preheating functions

----Preheating permitting condition:

If T4(outdoor ambient temperature)＜3□ and newly powered on or if T4＜3□ and compressor has stopped for over 3 hours, the compressor heating cable will work.

----Preheating mode:

A weak current flow through the coil of compressor from the wiring terminal of compressor, then the compressor is heated without operation.

----Preheating release condition:

If T4＞5□ or the compressor starts running, preheating function will stop.

8.5.10 Compressor crankcase heater

When T4<3□ and the compressor is not running, the crankcase heater will be active.

When T4≧5□ or the compressor starts up, the crankcase heater will stop work.

9. Troubleshooting

9.1 Indoor unit error code explanation:

Wall Mounted Indoor Units:

Display digital tube	LED STATUS	ODU Error code
E0	Indoor EEPROM malfunction	——
E1	Indoor/ outdoor units communication error	——
E2	Zero-crossing signal error	——
E3	Indoor fan speed has been out of control	——
E5	Open circuit or short circuit of outdoor temperature sensor or outdoor EEPROM malfunction	E0,E1,E2, E3,E4,E6
E6	Open circuit or short circuit of T1 or T2 temperature sensor	——
P0	IPM module protection or IGBT over-strong current protection	P4
P1	Voltage protection	E5
P2	Temperature protection of compressor top	P0,P1,P2
P3	Outdoor temp. too low protection(Optional for some models)	——
P4	Inverter compressor drive protection	E7, P7
P5	Mode conflict	——

Floor Console Models:

Operation	Timer	De-frost	LED STATUS
★	X	X	Open or short circuit of T1 temperature sensor
X	X	★	Open or short circuit of T2 temperature sensor
X	★	X	Indoor / outdoor units communication error
★	★	X	Indoor EEPROM malfunction
★	X	★	IPM module protection
★	★	★	Open or short circuit of T3 or T4 temperature sensor
★	●	X	Temperature protection of compressor top
★	◎	X	Inverter compressor drive protection
★	X	●	Mode conflict
★	●	★	Indoor fan speed has been out of control

★ flash at 5Hz, ● light, X extinguished, ◎flash at 0.5Hz.

Cassette / Ceiling &Floor Models:

Operation	Timer	De-frost	Alarm	LED STATUS
★	X	X	X	Open or short circuit of T1 temperature sensor
X	X	★	X	Open or short circuit of T2 temperature sensor
X	★	X	X	Indoor / outdoor units communication error
X	X	X	★	Full-water malfunction
★	★	X	X	Indoor EEPROM malfunction
★	X	X	●	IPM module protection
★	●	X	X	Open or short circuit of T3 or T4 temperature sensor
★	●	X	●	Voltage protection
★	★	★	★	Temperature protection of compressor top.
★	X	●	●	Mode conflict
★	●	●	X	Inverter compressor drive protection

★ flash at 2.5Hz, ● light, X extinguished.

Ceiling Concealed Duct Type:

Operation	Timer	De-frost	Alarm	LED STATUS	Display digital tube	ODU Error code
★	X	X	X	Open or short circuit of T1 temperature sensor	E0	——
X	X	★	X	Open or short circuit of T2 temperature sensor	E1	——
X	★	X	X	Indoor / outdoor units communication error	E2	——
X	X	X	★	Full-water malfunction	E3	——
★	★	X	X	Indoor EEPROM malfunction	E4	——
★	X	X	●	IPM module protection	E5	P4
★	●	X	X	Open or short circuit of T3 or T4 temperature sensor or outdoor EEPROM malfunction	E6	E0,E1,E2, E3,E4,E6
★	●	X	●	Voltage protection	P0	E5
★	★	★	★	Temperature protection of compressor top.	P3	P0
★	◎	X	X	Inverter compressor drive protection	P4	P7
★	X	●	X	Mode conflict	P5	——

★ flash at 2.5Hz, ● light, X extinguished ◎flash at 1Hz

9.2 Outdoor unit error code explanation:

Display digital tube	LED STATUS	IDU Error (Split type)	IDU Error (A5 Duct
E0	Outdoor EEPROM malfunction	E5	E6
E1	No A Indoor unit coil outlet temp. sensor or connector of sensor is defective	E5	E6
E2	No B Indoor unit coil outlet temp. sensor or connector of sensor is defective	E5	E6
E3	No C Indoor unit coil outlet temp. sensor or connector of sensor is defective	E5	E6
E6	No D Indoor unit coil outlet temp. sensor or connector of sensor is defective	E5	E6
E4	Open or short circuit of outdoor unit temperature sensor	E5	E6
E5	Voltage protection	P1	P0
E7	Communication malfunction between IPM board and outdoor main board	P4	P4
P0	Temperature protection of compressor discharge or compressor top. For M4OC-36HRDN1-M,it only means Temperature protection of compressor discharge	P2	P3
P1	High pressure protection (Only for M4OC-36HRDN1-M)	P2	P3
P2	Low pressure protection (Only for M4OC-36HRDN1-M)	P2	P3
P3	Current protection of compressor	——	——
P4	IPM module protection	P0	E5
P6	High temperature protection of condenser	——	——
P7	Inverter compressor drive protection	P4	P4
PF	PFC module protection (Only for M4OC-36HRDN1-M)	——	——

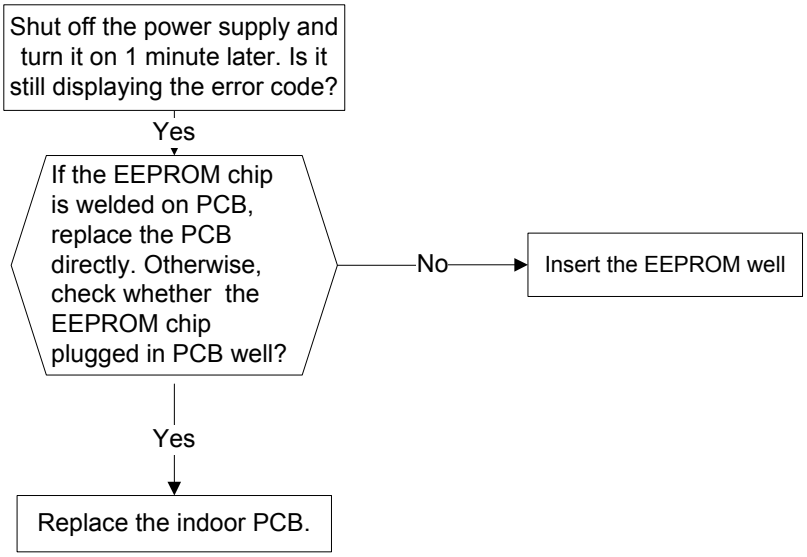
For YN027GMFI16M3D and YN036GMFI16M4D models:

Display	LED STATUS
E0	Outdoor EEPROM malfunction
E2	Indoor / outdoor units communication error
E3	Communication malfunction between IPM board and outdoor main board
E4	Open or short circuit of outdoor unit temperature sensor
E5	Voltage protection
E6	PFC module protection
F1	No A Indoor unit coil outlet temp. sensor or connector of sensor is defective
F2	No B Indoor unit coil outlet temp. sensor or connector of sensor is defective
F3	No C Indoor unit coil outlet temp. sensor or connector of sensor is defective
F4	No D Indoor unit coil outlet temp. sensor or connector of sensor is defective
P1	High pressure protection
P2	Low pressure protection
P3	Current protection of compressor
P4	Temperature protection of compressor discharge
P5	High temperature protection of condenser
P6	IPM module protection

9.3 Trouble shooting

9.3.1 Indoor unit trouble shooting

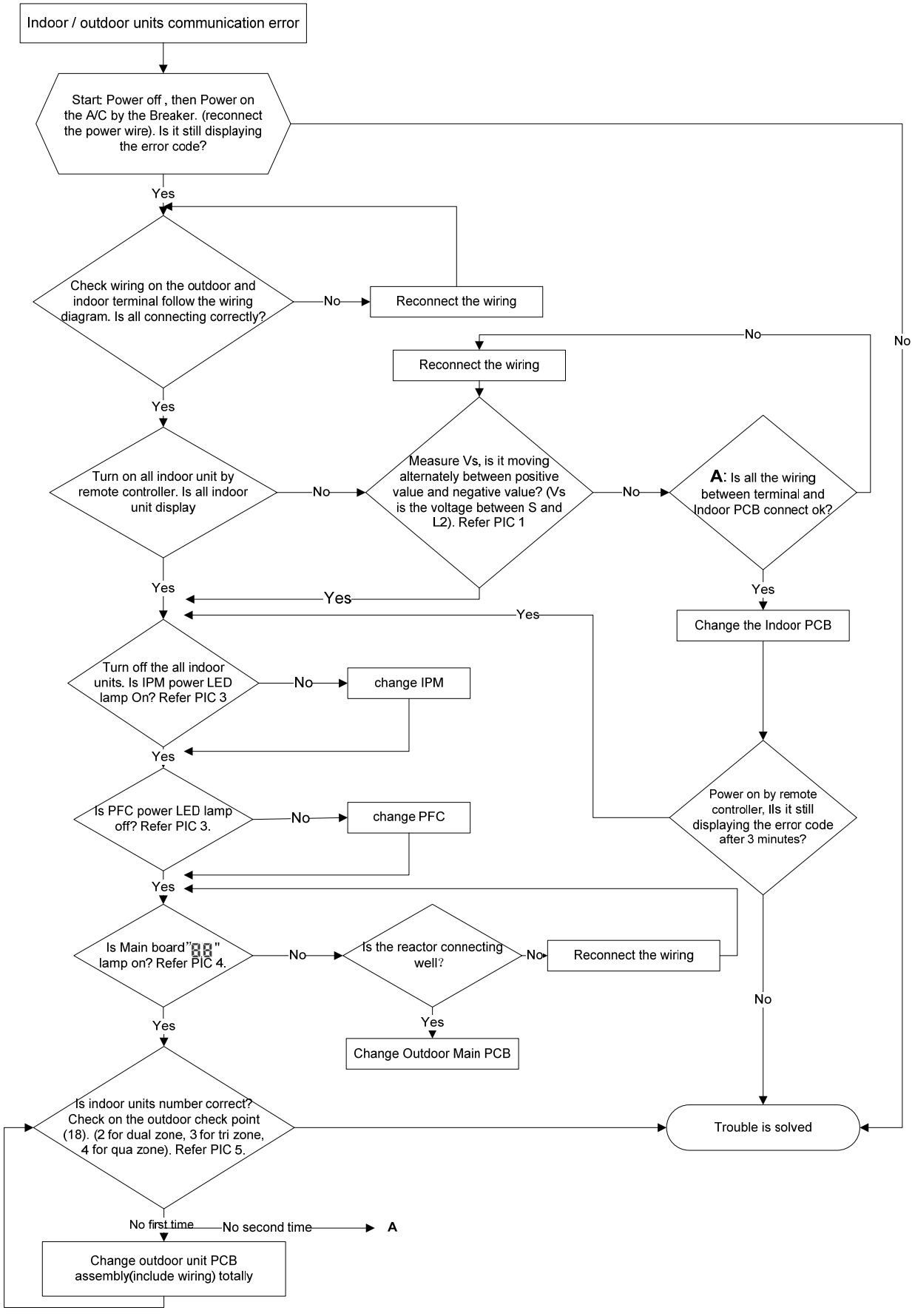
9.3.1.1 Indoor EEPROM malfunction



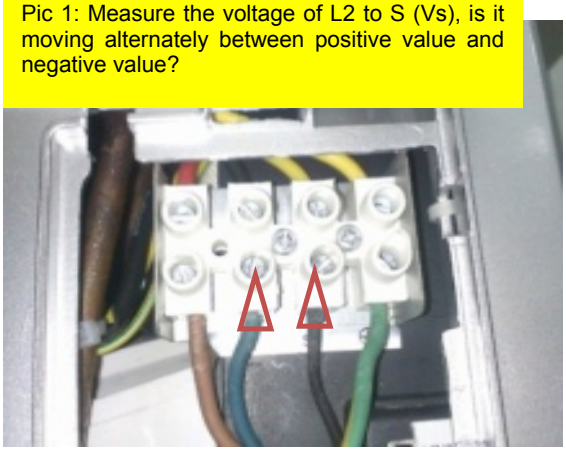
EEPROM: a read-only memory whose contents can be erased and reprogrammed using a pulsed voltage.

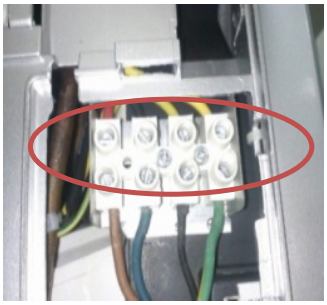
(EERROM chip may be solid for some models)

9.3.1.2 Indoor / outdoor unit communication error



Pic 1: Measure the voltage of L2 to S (Vs), is it moving alternately between positive value and negative value?





PIC 2, Check the wiring.

PIC 3: IPM (For dual/tri/quad-zone)

Fast check

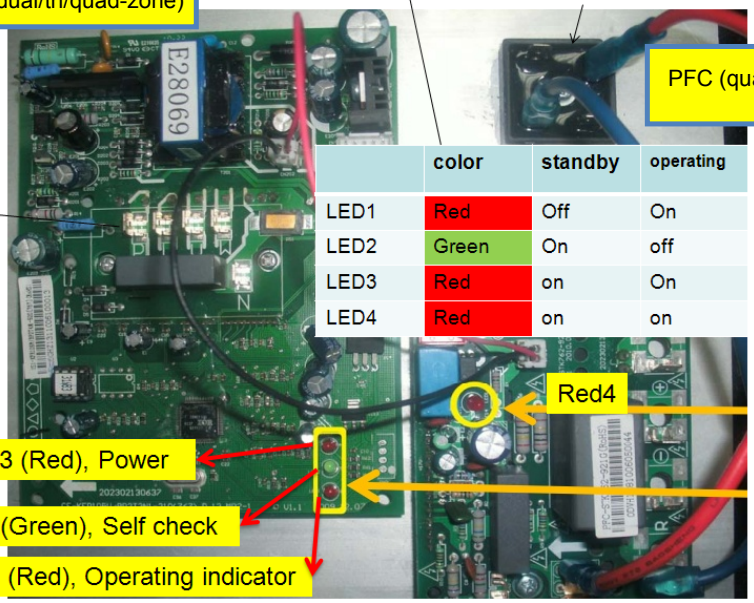
PFC board

Rectifier

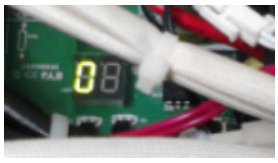
PFC (quad-zone only)

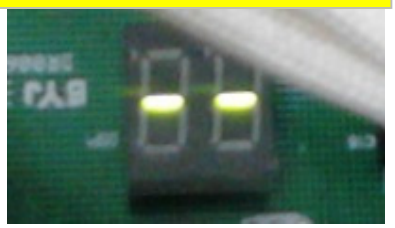
Make sure the wiring is correct.
U: Blue
V: Red
W: Black

	color	standby	operating
LED1	Red	Off	On
LED2	Green	On	off
LED3	Red	on	On
LED4	Red	on	on



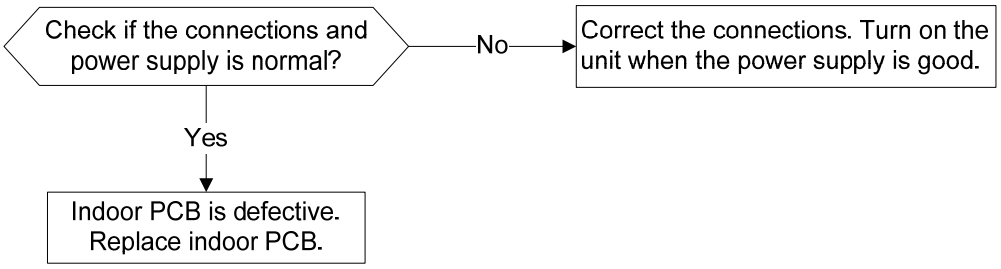
PIC4: Main board LED when power on and unit standby.



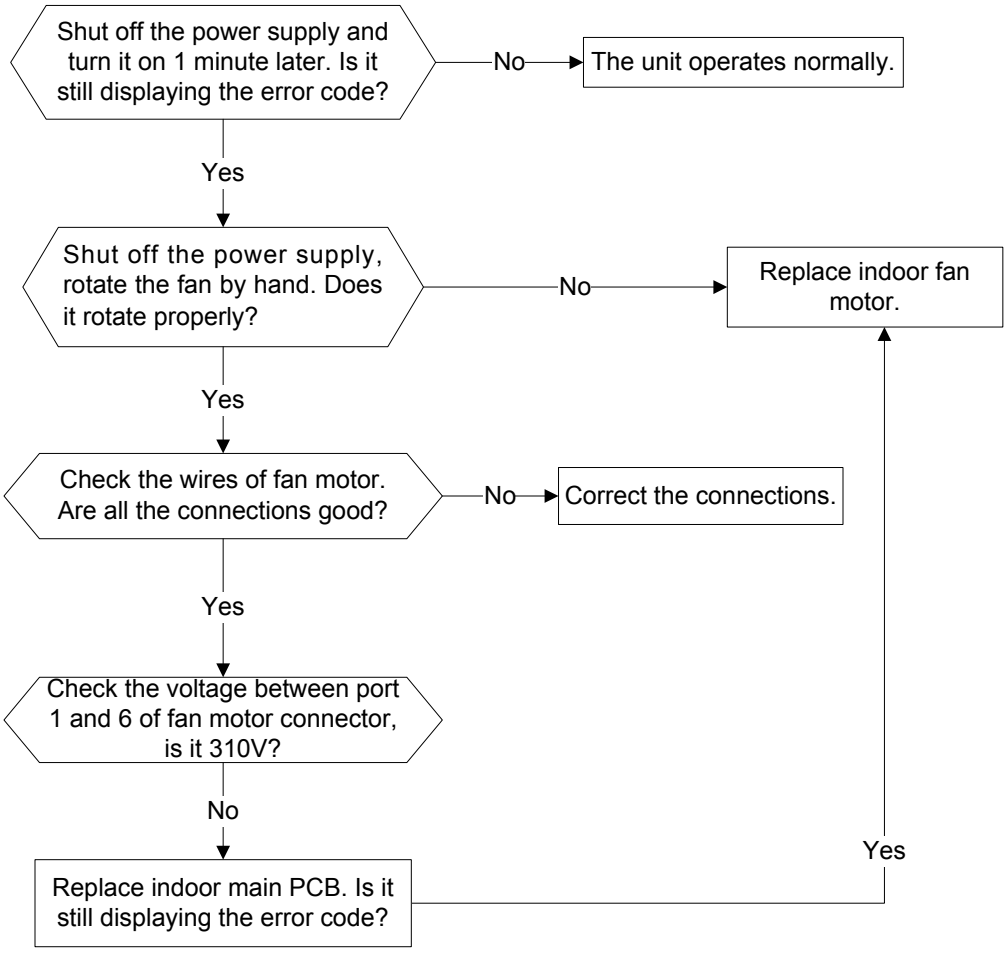


PIC 5: check point bottom,
press 18 times for check how many indoor units are connected.

9.3.1.3 Zero-crossing signal error

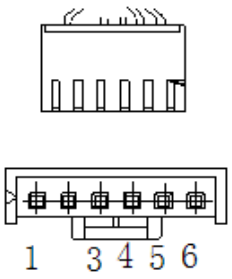


9.3.1.4 Indoor fan speed has been out of control (DC fan motor)

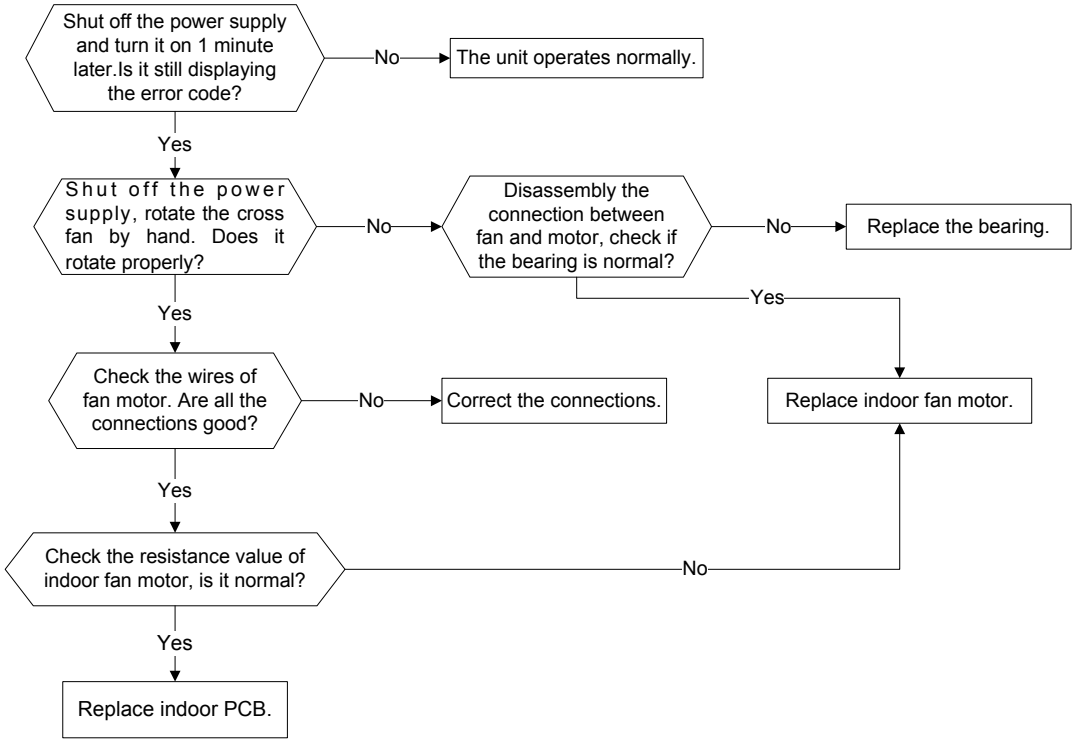


DC motor voltage input and output

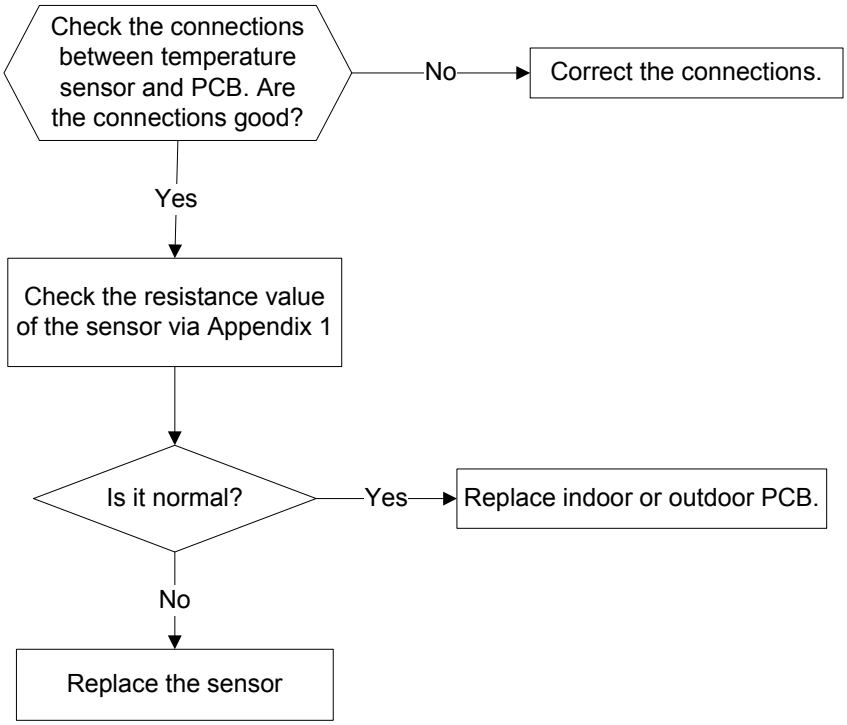
NO.	Color	Signal	Voltage
1	Red	Vs/Vm	280V~380V
2	---	---	---
3	Black	GND	0V
4	White	Vcc	14-17.5V
5	Yellow	Vsp	0~5.6V
6	Blue	FG	14-17.5V



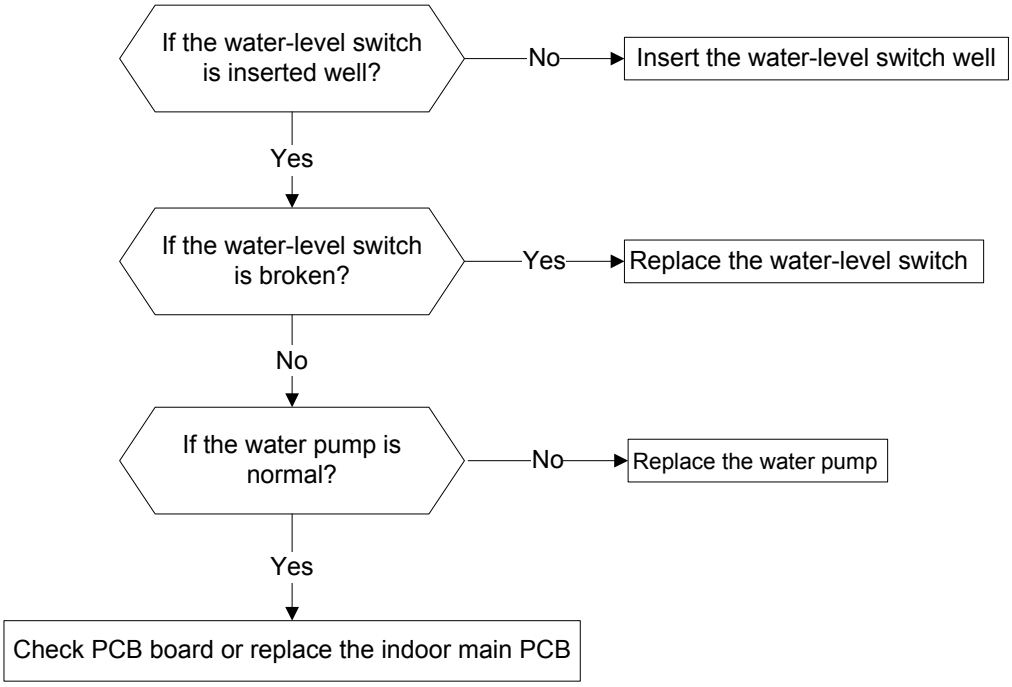
9.3.1.5 Indoor fan speed has been out of control (AC fan motor)



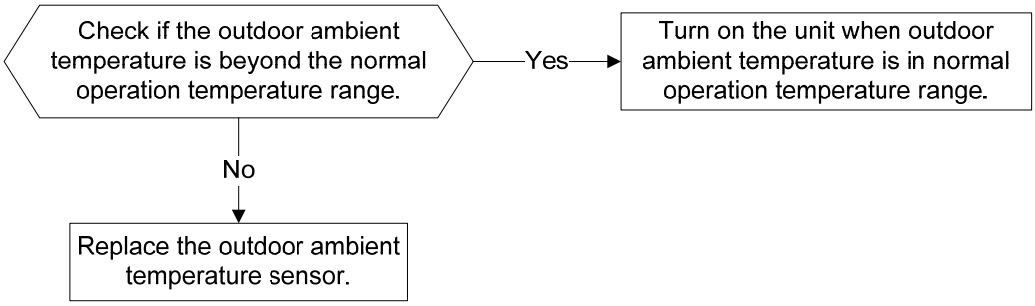
9.3.1.6 Open or short circuit of temperature sensor.



9.3.1.7 Full-water malfunction (For cassette/ceiling &Floor/ duct type)

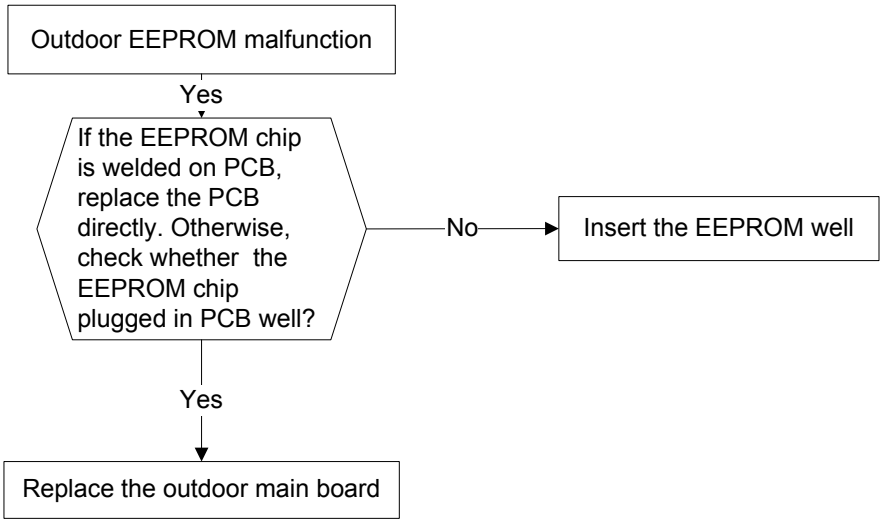


9.3.1.8 Outdoor temp. too low protection(Optional for some models)

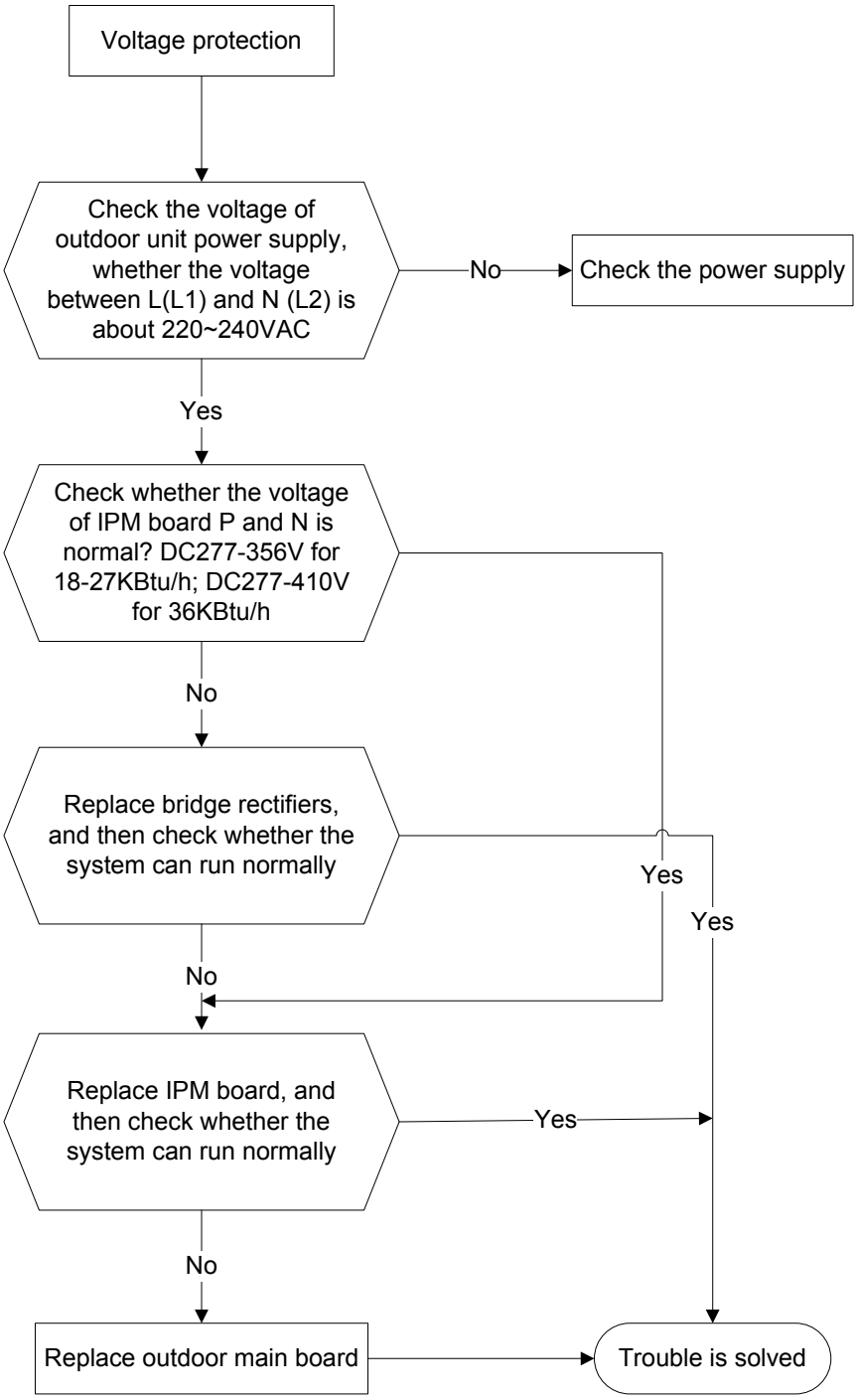


9.3.2 Outdoor unit trouble shooting

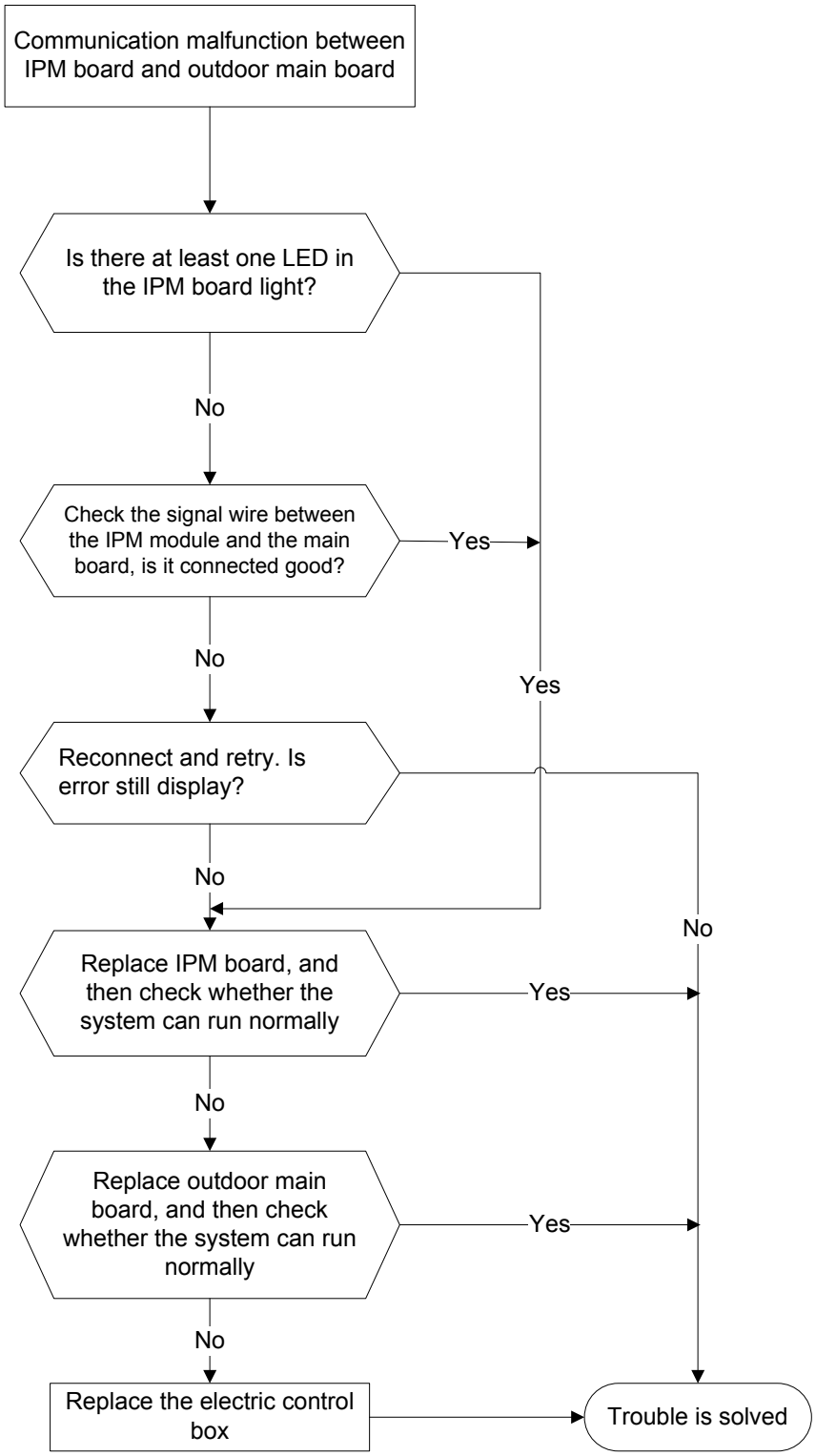
9.3.2 1 Outdoor EEPROM malfunction (ODU E0)



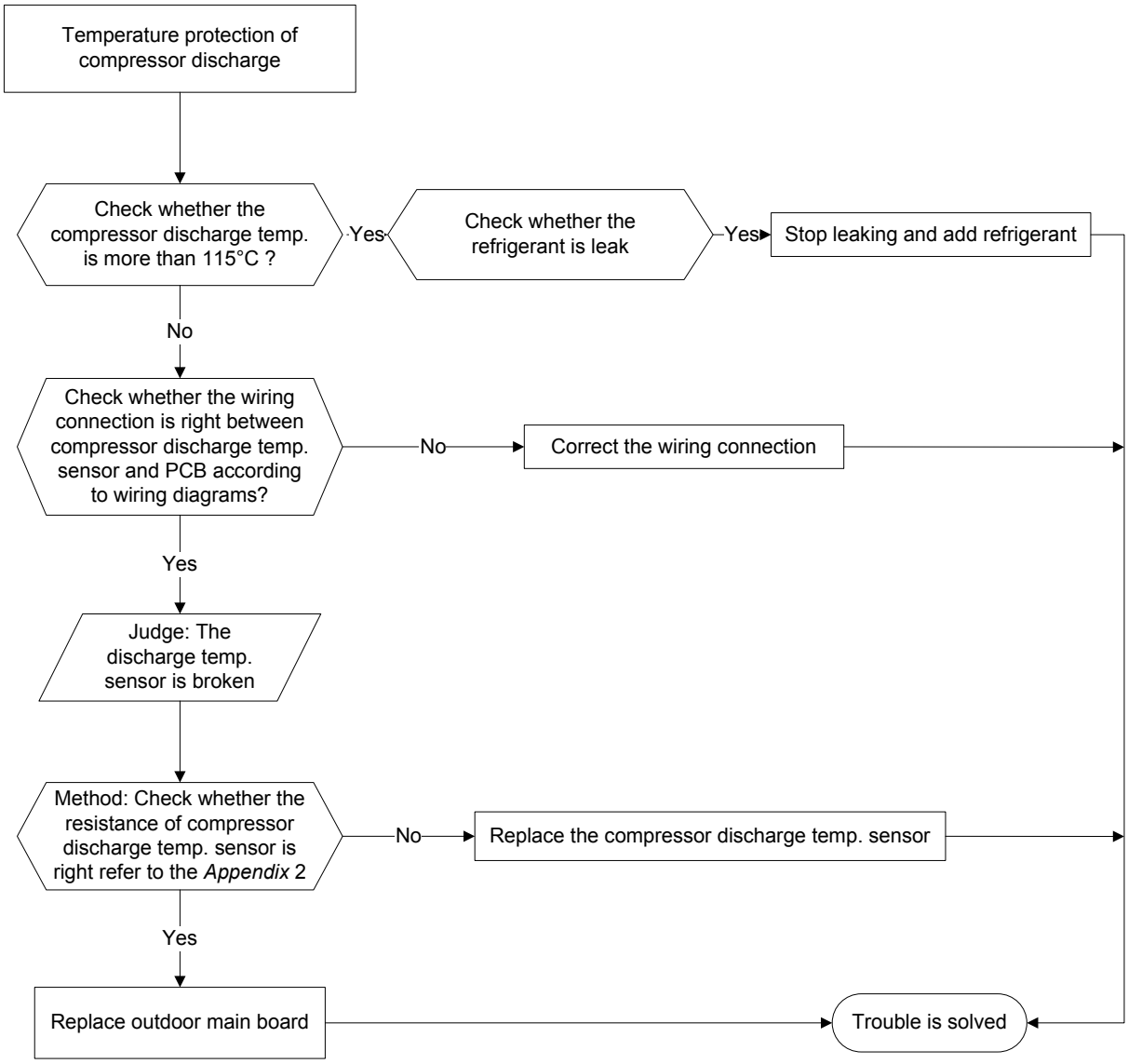
9.3.2.2 Voltage protection (ODU E5)



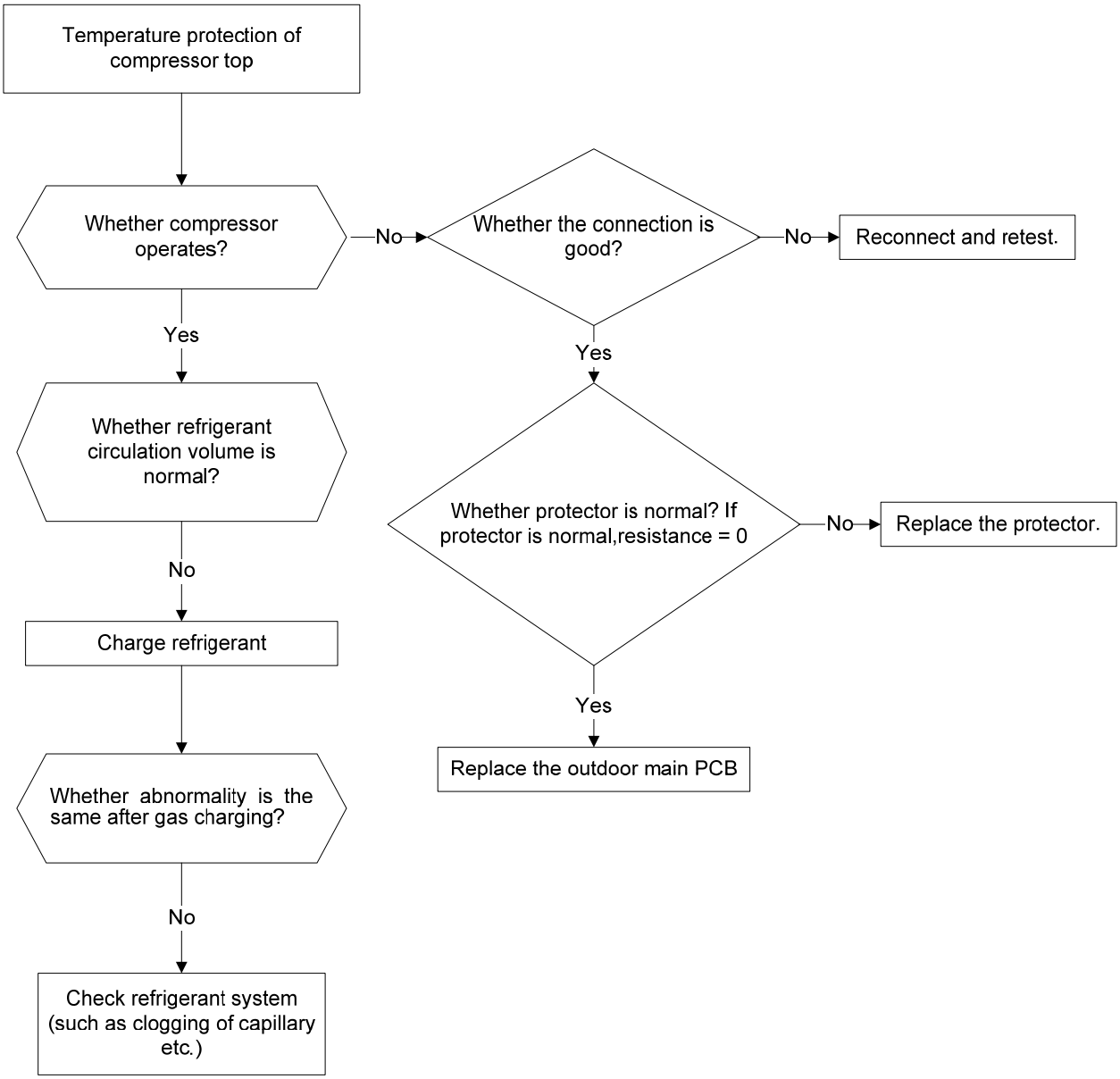
9.3.2.3 Communication malfunction between IPM board and outdoor main board (ODU E7)



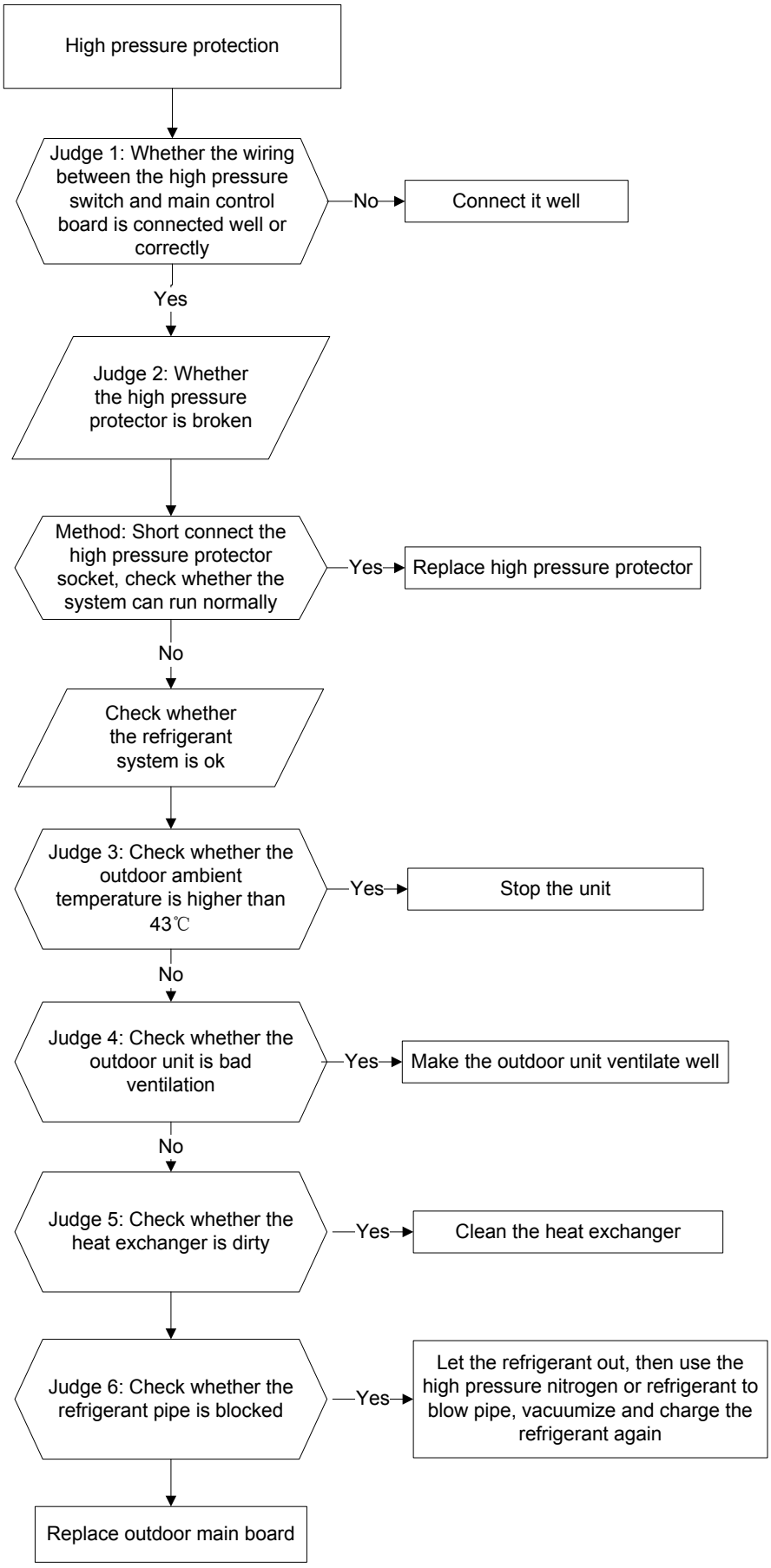
9.3.2.4 Temperature protection of compressor discharge (ODU P0)



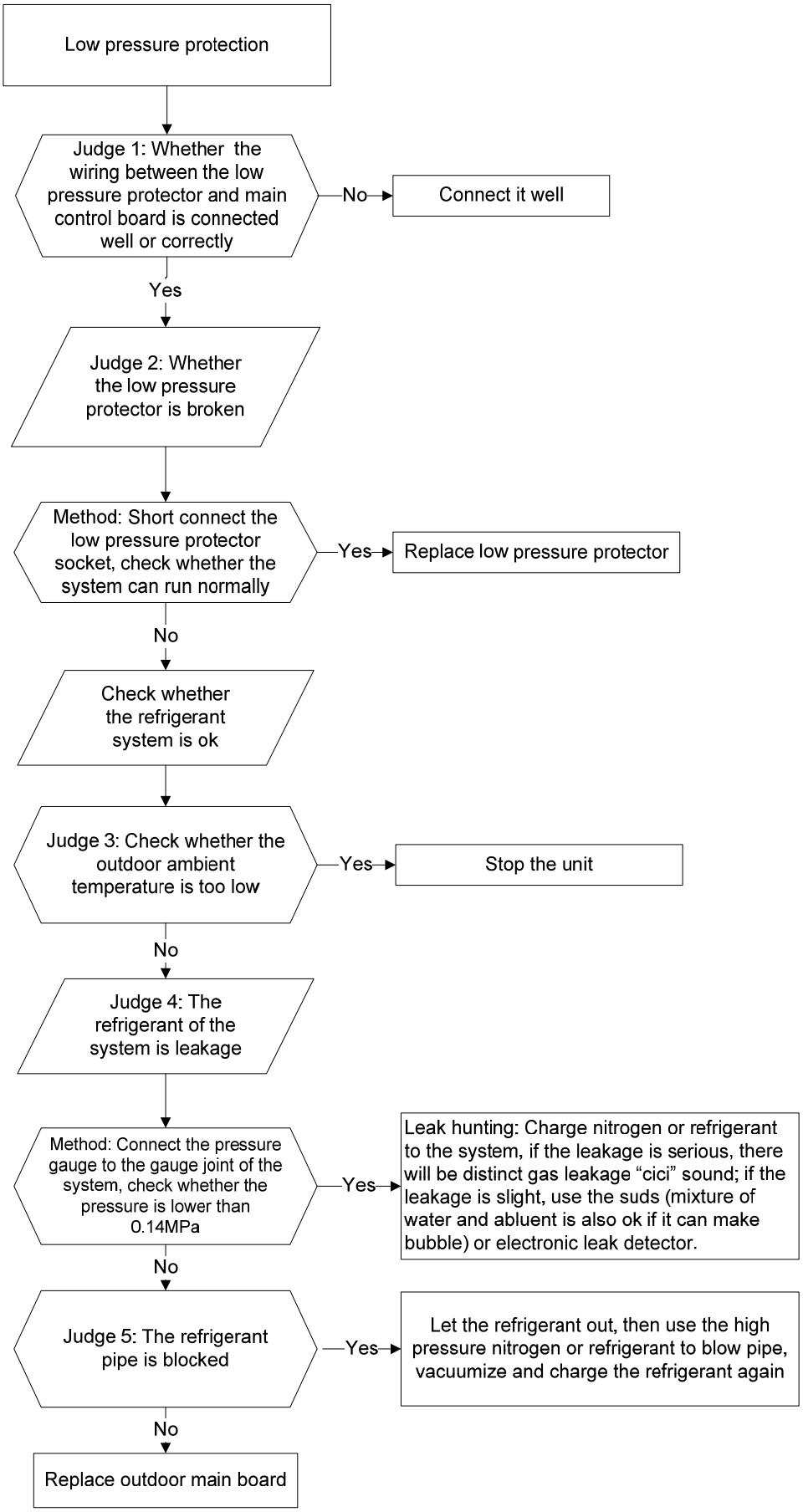
9.3.2.5 Temperature protection of compressor top (ODU P0)



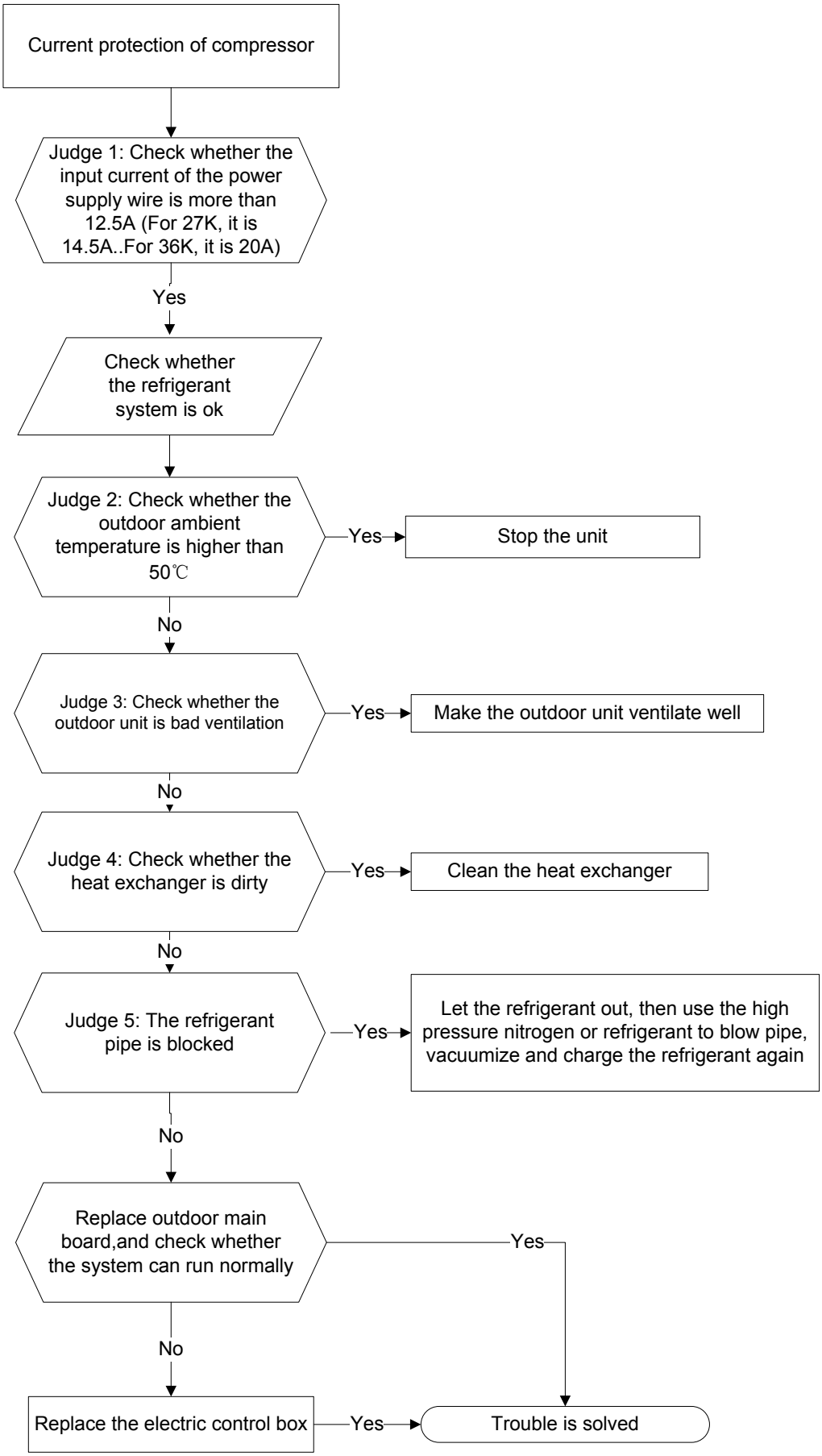
9.3.2.6 High pressure protection (ODU P1) (Only for YN036GMFI16M4D)



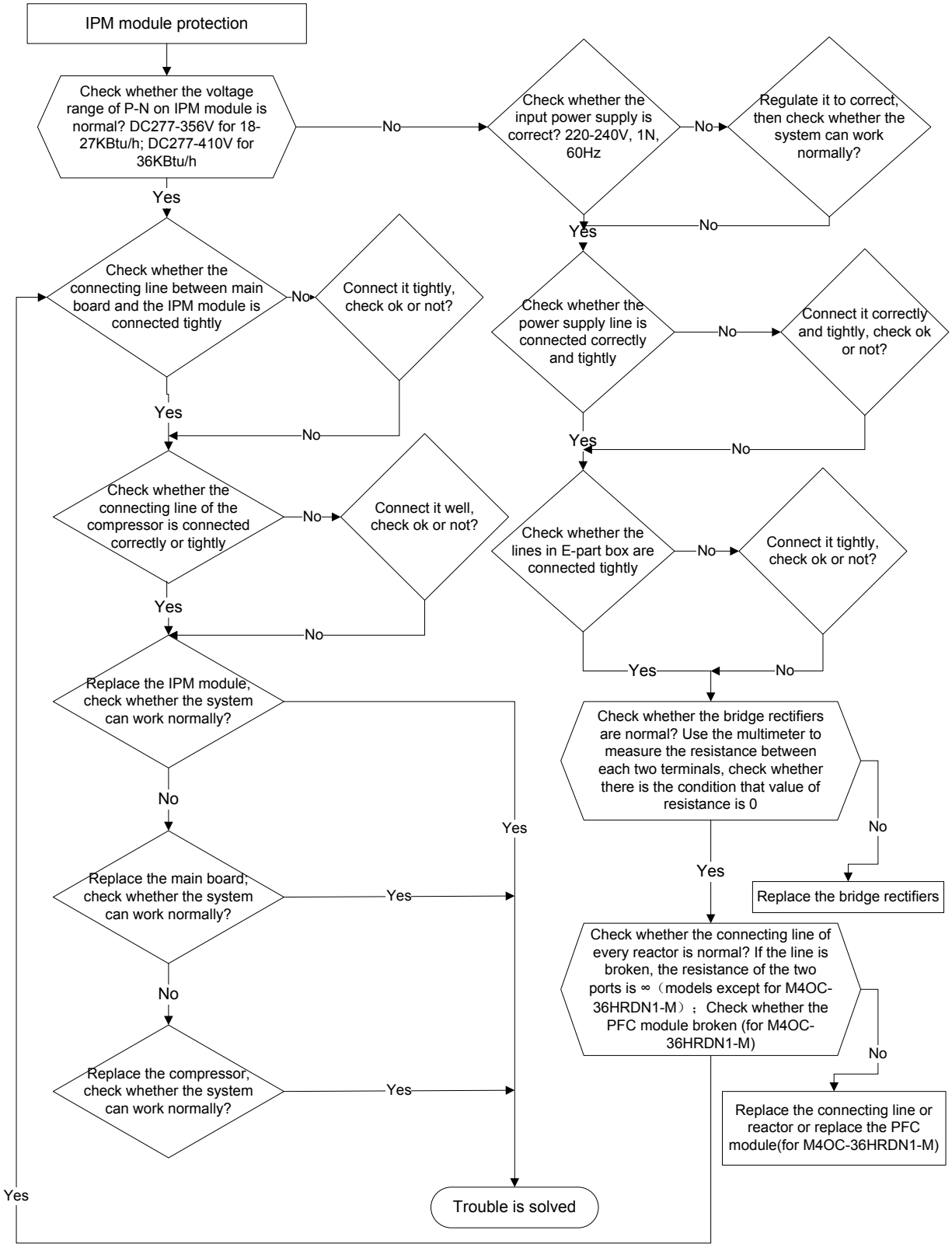
9.3.2.7 Low pressure protection (ODU P2) (Only for YN036GMFI16M4D)



9.3.2.8 Current protection of compressor (ODU P3)

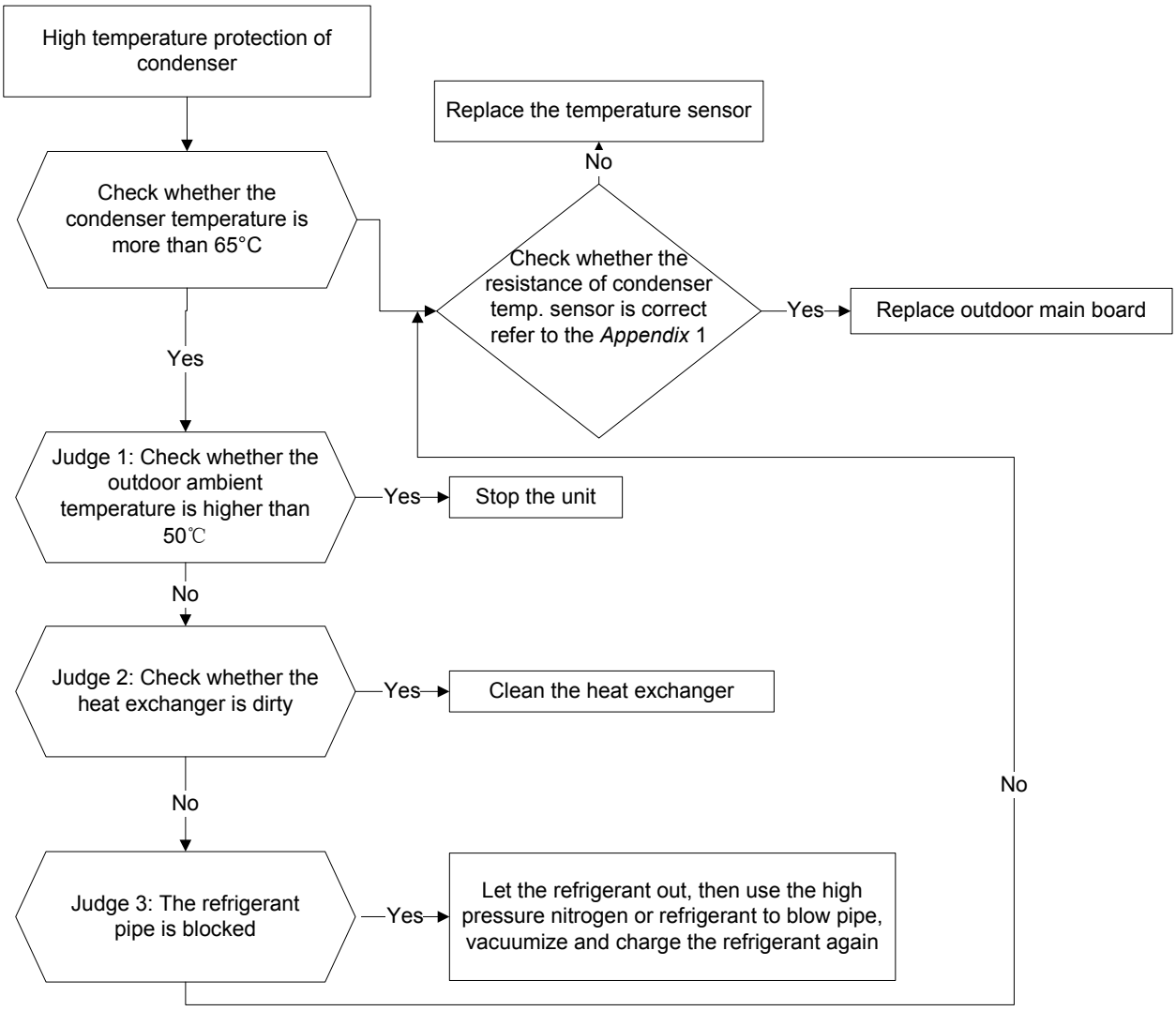


9.3.2.9 IPM module protection (ODU P4)

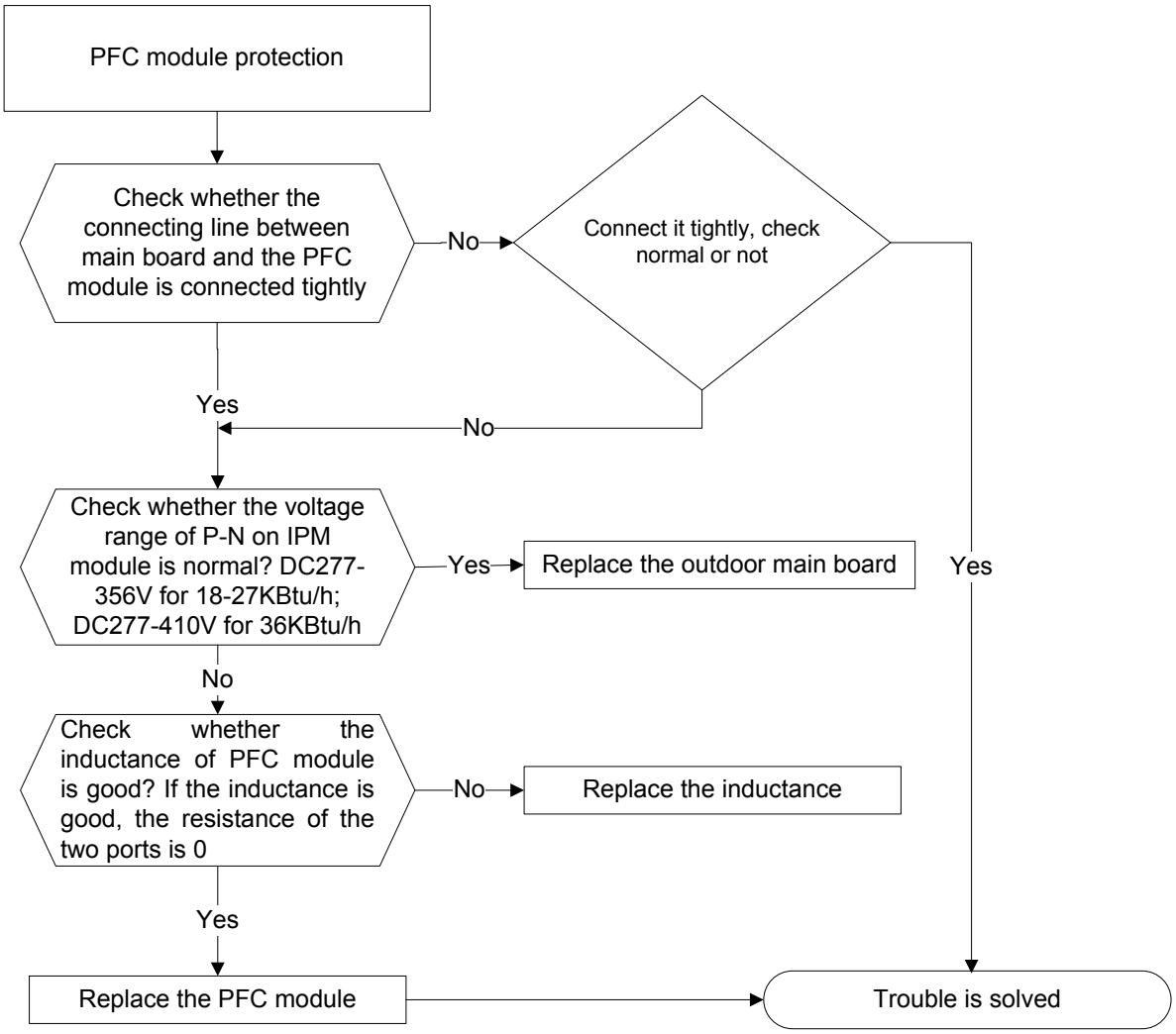


9.3.2.10 High temperature protection of condenser (ODU P6)

When outdoor pipe temperature is more than 65°C, the unit will stop, and unit runs again when outdoor pipe temperature is less than 52°C.



9.3.2.11 PFC module protection (ODU PF) (Only for YN036GMFI16M4D)



9.3.2.12 Inverter compressor drive protection (ODU P7)

The trouble shooting is same with one of IPM module protection

Appendix 1 Temperature Sensor Resistance Value Table (℃--K)

℃	K Ohm	℃	K Ohm	℃	K Ohm	℃	K Ohm
-20	115.266	20	12.6431	60	2.35774	100	0.62973
-19	108.146	21	12.0561	61	2.27249	101	0.61148
-18	101.517	22	11.5000	62	2.19073	102	0.59386
-17	96.3423	23	10.9731	63	2.11241	103	0.57683
-16	89.5865	24	10.4736	64	2.03732	104	0.56038
-15	84.2190	25	10.000	65	1.96532	105	0.54448
-14	79.3110	26	9.55074	66	1.89627	106	0.52912
-13	74.5360	27	9.12445	67	1.83003	107	0.51426
-12	70.1698	28	8.71983	68	1.76647	108	0.49989
-11	66.0898	29	8.33566	69	1.70547	109	0.48600
-10	62.2756	30	7.97078	70	1.64691	110	0.47256
-9	58.7079	31	7.62411	71	1.59068	111	0.45957
-8	56.3694	32	7.29464	72	1.53668	112	0.44699
-7	52.2438	33	6.98142	73	1.48481	113	0.43482
-6	49.3161	34	6.68355	74	1.43498	114	0.42304
-5	46.5725	35	6.40021	75	1.38703	115	0.41164
-4	44.0000	36	6.13059	76	1.34105	116	0.40060
-3	41.5878	37	5.87359	77	1.29078	117	0.38991
-2	39.8239	38	5.62961	78	1.25423	118	0.37956
-1	37.1988	39	5.39689	79	1.21330	119	0.36954
0	35.2024	40	5.17519	80	1.17393	120	0.35982
1	33.3269	41	4.96392	81	1.13604	121	0.35042
2	31.5635	42	4.76253	82	1.09958	122	0.3413
3	29.9058	43	4.57050	83	1.06448	123	0.33246
4	28.3459	44	4.38736	84	1.03069	124	0.32390
5	26.8778	45	4.21263	85	0.99815	125	0.31559
6	25.4954	46	4.04589	86	0.96681	126	0.30754
7	24.1932	47	3.88673	87	0.93662	127	0.29974
8	22.5662	48	3.73476	88	0.90753	128	0.29216
9	21.8094	49	3.58962	89	0.87950	129	0.28482
10	20.7184	50	3.45097	90	0.85248	130	0.27770
11	19.6891	51	3.31847	91	0.82643	131	0.27078
12	18.7177	52	3.19183	92	0.80132	132	0.26408
13	17.8005	53	3.07075	93	0.77709	133	0.25757
14	16.9341	54	2.95896	94	0.75373	134	0.25125
15	16.1156	55	2.84421	95	0.73119	135	0.24512
16	15.3418	56	2.73823	96	0.70944	136	0.23916
17	14.6181	57	2.63682	97	0.68844	137	0.23338
18	13.9180	58	2.53973	98	0.66818	138	0.22776
19	13.2631	59	2.44677	99	0.64862	139	0.22231

Appendix 2

Unit: □---K		Discharge temp. sensor table					
-20	542.7	20	68.66	60	13.59	100	3.702
-19	511.9	21	65.62	61	13.11	101	3.595
-18	483	22	62.73	62	12.65	102	3.492
-17	455.9	23	59.98	63	12.21	103	3.392
-16	430.5	24	57.37	64	11.79	104	3.296
-15	406.7	25	54.89	65	11.38	105	3.203
-14	384.3	26	52.53	66	10.99	106	3.113
-13	363.3	27	50.28	67	10.61	107	3.025
-12	343.6	28	48.14	68	10.25	108	2.941
-11	325.1	29	46.11	69	9.902	109	2.86
-10	307.7	30	44.17	70	9.569	110	2.781
-9	291.3	31	42.33	71	9.248	111	2.704
-8	275.9	32	40.57	72	8.94	112	2.63
-7	261.4	33	38.89	73	8.643	113	2.559
-6	247.8	34	37.3	74	8.358	114	2.489
-5	234.9	35	35.78	75	8.084	115	2.422
-4	222.8	36	34.32	76	7.82	116	2.357
-3	211.4	37	32.94	77	7.566	117	2.294
-2	200.7	38	31.62	78	7.321	118	2.233
-1	190.5	39	30.36	79	7.086	119	2.174
0	180.9	40	29.15	80	6.859	120	2.117
1	171.9	41	28	81	6.641	121	2.061
2	163.3	42	26.9	82	6.43	122	2.007
3	155.2	43	25.86	83	6.228	123	1.955
4	147.6	44	24.85	84	6.033	124	1.905
5	140.4	45	23.89	85	5.844	125	1.856
6	133.5	46	22.89	86	5.663	126	1.808
7	127.1	47	22.1	87	5.488	127	1.762
8	121	48	21.26	88	5.32	128	1.717
9	115.2	49	20.46	89	5.157	129	1.674
10	109.8	50	19.69	90	5	130	1.632
11	104.6	51	18.96	91	4.849		
12	99.69	52	18.26	92	4.703		
13	95.05	53	17.58	93	4.562		
14	90.66	54	16.94	94	4.426		
15	86.49	55	16.32	95	4.294	B(25/50)=3950K	
16	82.54	56	15.73	96	4.167		
17	78.79	57	15.16	97	4.045	R(90℃)=5KΩ±3%	
18	75.24	58	14.62	98	3.927		
19	71.86	59	14.09	99	3.812		

Appendix 3

1. Reference voltage data:

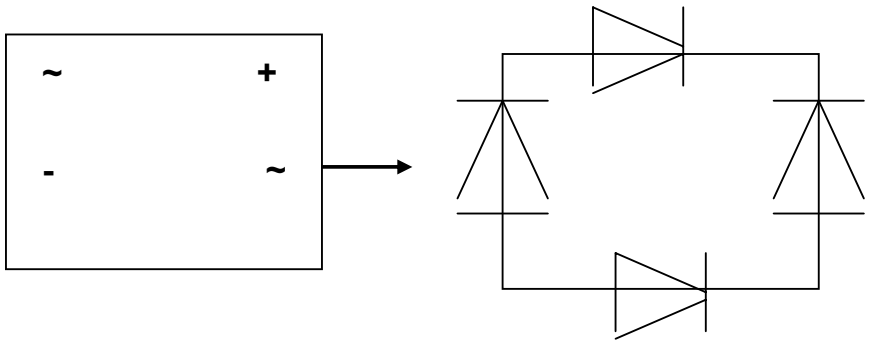
a) Rectifier : Input :220-230V(AC), output :310V(DC)

b) Inverter module: U,V, W 3ph.

	Result
U-V	60-150V(AC)
U-W	60-150V(AC)
V-W	60-150V(AC)
P-N	DC 310V

2. Check the Diode Bridge component (In wiring diagram, rectifier)

Remark: If this part is abnormal, the LED will not light.



Multi-meter		Result	
		Forward Resistance	Backward Resistance
+	—	Infinite	Infinite
~	+	~1.7M ohm	Infinite
~			
-	~	~1.7M ohm	Infinite
	~		

Appendix 4:

℃	10	11	12	13	14	15	16	17	18	19	20	21	22
℉	48	50	52	54	56	58	60	62	64	66	68	70	72
℃	23	24	25	26	27	28	29	30	31	32	33	34	35
℉	74	76	78	80	82	84	86	88	90	92	94	96	98

Appendix 5:

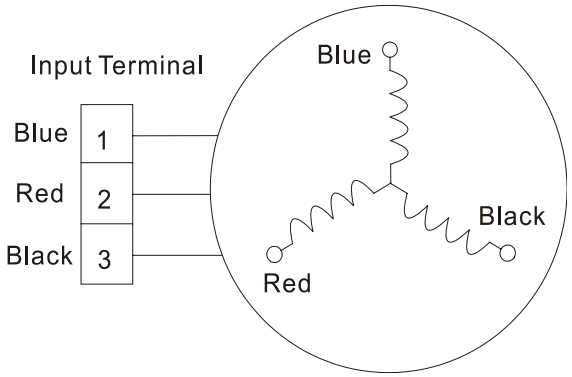
Spec.

	Outdoor unit		
Model	1x2	1x3	1x4
Compressor	DA130S1C-20FZ	DA150S1C-20FZ	TNB306FPGMC-L
Outdoor fan motor	YDK70-6FB	YDK70-6FB	YDK180-8GB

	Indoor unit		
Model	9k Wall	12k Wall	18k Wall
Indoor fan motor	RPG20B	RPG20B	RPG28H
Model	9k Wall	12k Wall	18k Wall
Indoor fan motor	RPG20B	RPG20B	RPG28H
Model	/	12k A5	18k A5
Indoor fan motor	/	YSK27-4G	YSK68-4B
Model	/	12k Cassette	18k Cassette
Indoor fan motor	/	YDK45-6B	YDK45-6B
Model	/	12k Ceiling&Floor	18k Ceiling&Floor
Indoor fan motor	/	YSK25-6L	YSK25-6L

1. Compressor checking

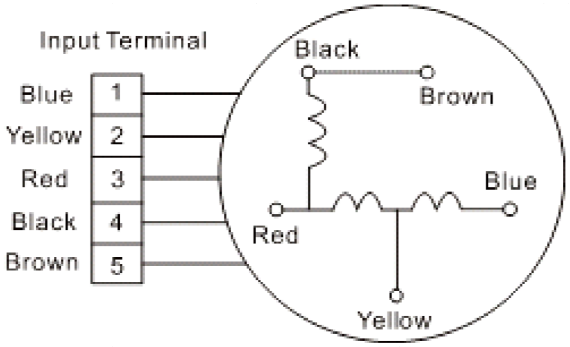
Measure the resistance value of each winding by using the tester.



Position	**Resistance Value**		
	DA130S1C-20FZ	DA150S1C-20FZ	TNB306FPGMC-L
Blue - Red	0.95Ω(20℃)	0.95Ω(20℃)	0.53Ω(20℃)

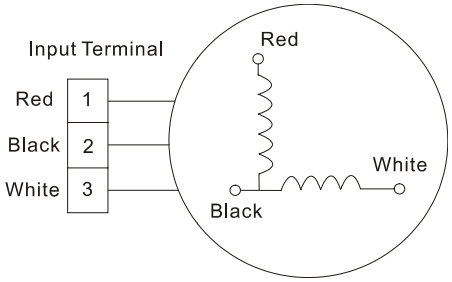
2. Fan Motor.

Measure the resistance value of each winding by using the tester.



Position	Resistance Value					
	YDK70-6FB	YDK180-8GB	YSK27-4G	YSK68-4B	YDK45-6B	YSK25-6L
Black - Red	56Ω±8% (20℃)	24.5Ω±8% (20℃)	317Ω±8% (20℃)	145Ω±8% (20℃)	345Ω±8% (20℃)	627Ω±8% (20℃)
Red - Yellow	76Ω±8% (20℃)	19Ω±8% (20℃)	252Ω±8% (20℃)	88Ω±8% (20℃)	150Ω±8% (20℃)	374.3Ω±8% (20℃)
Yellow - Blue	76Ω±8% (20℃)	19Ω±8% (20℃)	252Ω±8% (20℃)	88Ω±8% (20℃)	150Ω±8% (20℃)	374.3Ω±8% (20℃)

Measure the resistance value of each winding by using the tester



Position	Resistance Value	
	RPG20B	RPG28H
Black - Red	381Ω±8% (20℃)	183.6Ω±8% (20℃)
White - Black	267Ω±8% (20℃)	206Ω±8% (20℃)